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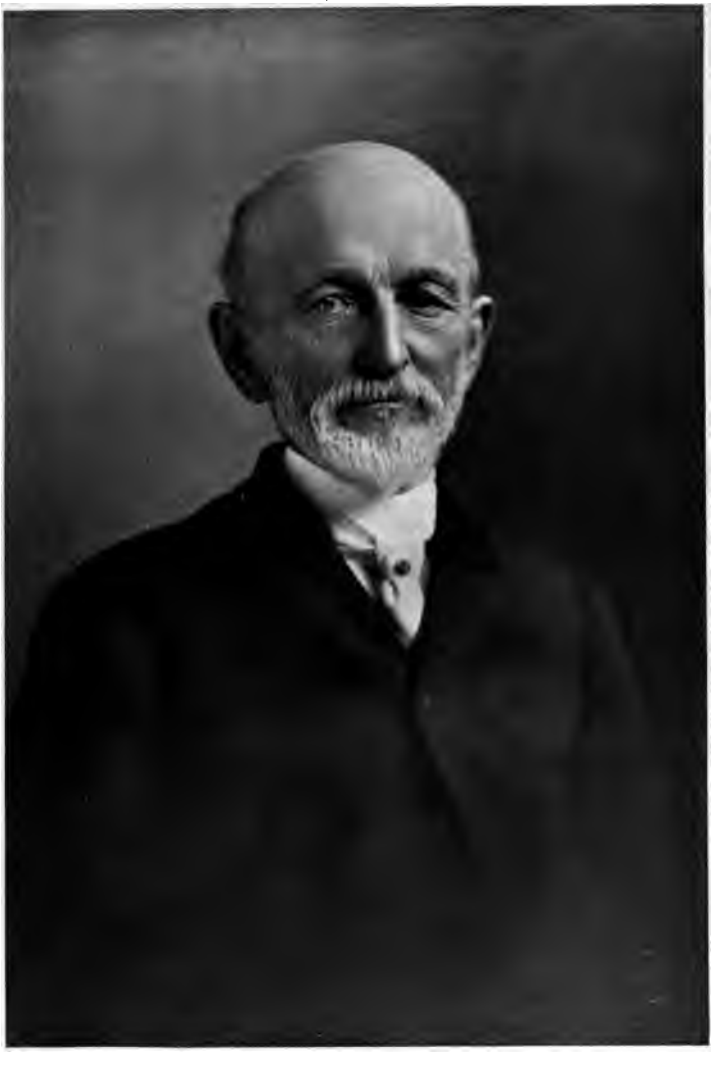
THE MEMOIRS
OF
CHARLES H. CRAMP



CHARLES H. CRAMP

THE MEMOIRS

OF

CHARLES H. CRAMP

BY

AUGUSTUS C. BUELL

Author of "Life of Paul Jones," "History of Andrew Jackson," "Life of Sir William Johnson," Etc.

PHILADELPHIA AND LONDON

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PREFACE

It is not often that the memoirs of a man cover the history of threescore years of active manhood. Still more rare is it that the period covered happens to be the most fruitful of progress known in the annals of mankind. And yet more remarkable, even to the point of the unique, is it that such a career, in such an epoch, should be inextricably interwoven with the history of one of the fairest arts and one of the most fascinating sciences,—Naval Architecture and Ship-building.

All this is true of the subject of this memoir, Charles Henry Cramp.

Such phrases as "prominently identified with" or "an acknowledged leader in" his sphere of creative activity do not adequately express Charles H. Cramp's personal and professional relation, or rather his individual identification, with the maritime and naval history of his country. Those phrases applied to his status and his rank would be commonplace.

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His impress is far deeper than that, and the association of his name and his personality with the art and its triumphs have become a symbol.

The generation of naval architects and shipbuilders among whom he began his life-work sixty years ago have long since passed away. Of them all he stands alone, the only surviving link that binds the romantic memories of wood and canvas to the grim realities of steel and steam. Even the generation that knew him in the middle of his long and fruitful career is gone. He is the only man who has alike designed and built ships for the navy of the Civil War and for that of to-day,—alike for the navy that fought at Charleston and Fort Fisher and for the navy that won Santiago and Manila Bay,—twoscore years asunder! In all the history of our country there has never been another professional career like his. No other man ever made such an impress as he upon the life, welfare, and progress of the nation. No other man, without ever holding a public office, has so indelibly left his mark upon our greatest and most vital public interests as he has done.

He has passed from the sphere of member-

ship in his profession and has become its exponent. His name is a synonym for the art in which he has so long been master, and the mention of his personality instantly suggests the science whose triumphs he has so often and so well won.

This status and this rank are by no means limited to our own country. Mr. Cramp is as familiar in London as in Philadelphia; as well known in Tokio and St. Petersburg as in New York or Washington.

Undoubtedly, the first impression one will derive from the study of Mr. Cramp's career and character as mirrored in his acts and his writings is his singleness of purpose, fixity of resolve, and directness of method. These are, in fact, his distinctive traits, and to them, throughout his long and arduous life, all others have been rigorously subordinated. If he appears to be exacting of others, he is yet more so with himself. It is not to be expected that in a life so long, in an experience covering literally the scope of the civilized world, and in a range of endeavor so wide and diversified, all could be plain sailing. On the other hand, few men have encountered more or greater obsta-

cles. No man ever faced them more cheerfully or combated them with more sanguine pluck. If he did not always triumph over them, it was because they were insurmountable, or because those upon whom he relied for a proper share in the sum-total of effort failed him. He himself never left undone anything that a clear head could devise or a resolute will strive for.

But with all his singleness of purpose, fixity of resolve, and directness of method in professional pursuits, Charles H. Cramp, as a member of society at large, is a man of the broadest vision and most comprehensive culture. Intent as he may be upon his work, he "never takes the shop home with him," as the saying is. He has always possessed the happy faculty of laying down his burdens at the close of each working-day to find mental recreation in social occasions, in general literature, art, and the higher order of social amusements. A clever writer in a magazine sketch of him many years ago said, "Charles H. Cramp knows more about more things than any other man of his time!" Unlike most epigrams, this is true, and in terse fashion it conveys a portrayal of his intellectual make-up. Mastery of

the literature of his own profession, rich and varied as it is, forms but a small part of Mr. Cramp's mental equipment. To all these attainments add the lessons and observations of wide travel and constant association with leading minds and controlling personalities at home and abroad, and the result is a perfectly equipped, all-round man of affairs.

During his whole active career Mr. Cramp has held positions of command. At the age of nineteen he began to direct operations and assume responsibilities; and such status he has maintained for threescore years, with constantly increasing volume of operations and incessantly growing weight of responsibility. But through all he has kept the even tenor of his way, neither elated by triumphs nor depressed by reverses, and guided always by an inflexible integrity and a scrupulous honesty that are proverbial.

CONTENTS

CHAPTER I

PAGE

Early Shipbuilding in Philadelphia and Colonies—Paul Jones—Joshua Humphreys—Alliance—Truxtun—Embargo—Decade following War of 1815—Rebecca Sims—Inauguration of Packet Lines—Thomas P. Cope—Decay of Eastern Trade in Philadelphia—Auction Sales of Cargoes..... 11

CHAPTER II

Birth—Relatives—High School—Magnetic Observatory—Note on Davidson—Surf-boats for Mexican War—First Propeller Tug Sampson—Shipbuilders of New York and Philadelphia—Clipper Ships, 1850—Zenith of American Carrying Trade—Crimean War—Cunard Line—Libertador—Armored Ships—Board Appointed to Take Charge of Appropriation to Build Them—Account of New Ironsides—The Monitor—Speech of Bishop Simpson—Sub-Department of Navy—Light-draught Monitors—Sinking of the First—Collapse of Sub-Department—Rebuilding of Yazoo, Tunxis and Others—Miantonomah—Origin of Fast Cruisers—Evolution of Modern Marine Engineering in this Country..... 39

CHAPTER III

Foreign Commerce in 1865—The Clyde and George W. Clyde, and Introduction of Compound Engines—Commerce of 1870—Merchant Marine—Lynch Committee—Mr. Cramp and Committee—Lynch Bill—American Steamship Company—Visit to British Shipyards—John Elder—British Methods—Interchange of Methods—Merchant Marine, Continued—Dingley Bill—Defects—Act of 1891, Providing Registry for Foreign Ships—St. Louis and St. Paul—Extract from *Forum*—Remarks on Article—Committee of Shipbuilders and Owners—New Bill Introduced by Frye and Dingley—North Atlantic

CHAPTER III
(CONTINUED)

PAGE

Traffic Association—New Shipyards—Tactics of North Atlantic Traffic Association—Our Navigation Laws, *North American Review*—Mr. Whitney—Unfriendly Legislation—Mr. Whitney's Letter—Effects of Letter—Mr. Cramp's Letter to Committee of Merchant Marine—International Mercantile Marine..... 97

CHAPTER IV

Condition of Navy after Civil War—Admiral Case's Fleet—Virginius Scare—Huron, Alert and Ranger—Secretary Hunt—First Advisory Board—Secretary Chandler—Puritan Class—Finished—Steel—Hon. J. B. McCreary and Appropriation Bill for New Navy—Members of Second Naval Advisory Board—Standard for Steel for New Ships Chicago, Boston, Atlanta and Dolphin—Secretary Whitney—Beginning of New Navy, by Charles H. Cramp—Baltimore, Charleston and Yorktown—Purchase of Drawings by Navy Department—Commodore Walker—Premium System—Mr. Whitney's Views—Premiums Paid—Attack on System—Secretary Tracy—War College Paper—Classifying Bids..... 154

CHAPTER V

Armstrongs—Russian Warship Construction—Arrival of Cimbria at Bar Harbor—Visit of Wharton Barker to Shipyard—Visit of Captain Semetschkin and Commission to the Yard—Purchase of Ships—Newspaper Accounts—Captain Gore-Jones—Mr. Cramp's Account of Operations—Europe, Asia, Africa and Zabiaca—Popoff and Livadia—Visit to Grand Duke Constantine—Anniversary Banquet in St. Petersburg of Survivors of Cimbria Expedition—Object of Visit to Russia—Mr. Dunn and Japan—Contract for Kasagi—Jubilee Session of Naval Architects in London—Visit to Russia—Correspondence with Russian Officials—Visit to Armstrongs'—Japanese Warship Construction—Coming Sea Power—Correspondence with Russian Officials—Invited to Russia—Asked to Bid for Warships—Our Ministers Abroad—Construction of Retvizan and Variag—Maine..... 205

ILLUSTRATIONS

PAGE

CHARLES H. CRAMP ..... *Frontispiece*

CLIPPERSHIP MORNING LIGHT 12

CLIPPERSHIP MANITOU 24

CRUISER YORKTOWN 36

MONITOR TERROR 48

CRUISERS BALTIMORE AND PHILADELPHIA 60

CRUISER NEWARK 72

CRUISERS PENNSYLVANIA AND COLORADO 84

CRUISER COLUMBIA 96

ARMORED CRUISER BROOKLYN 108

ARMORED CRUISER NEW YORK 120

BATTLESHIP NEW IRONSIDES 132

BATTLESHIP IOWA 144

BATTLESHIP ALABAMA 156

BATTLESHIP MAINE 158

BATTLESHIP RETVIZAN IN COMMISSION 180

BATTLESHIP RETVIZAN DOCKING 192

CRUISER VARIAG 204

AMERICAN LINER ST. PAUL 216

MEDI-J-IEH LAUNCHING 228

MEDI-J-IEH IN COMMISSION 240

MEMOIRS

OF

CHARLES H. CRAMP

CHAPTER I

Early Ship-building in Philadelphia and Colonies—Paul Jones—Joshua Humphreys—"Alliance"—Truxtun—Embargo—Decade following War of 1815—"Rebecca Sims"—Inauguration of Packet Lines—Thomas P. Cope—Decay of Eastern Trade in Philadelphia—Auction Sales of Cargoes.

THE historical value of the character and career of individuals must be rated by their share in and impress upon the events of their time. This is equally true of success and failure. For example, the most famous man of modern time terminated his career in the most colossal failure known to history,—Napoleon Bonaparte Yet, if we judge by the interest the civilized world takes in every shred of his history and by the perennial halo that envelops his name, people do not think about either his triumphs or his disasters, but fix their atten-

tion singly upon the impress he made upon civilization.

On the other hand, George Washington ended his career in success and glory. But few, except students and pedants, know much about Washington beyond that he was the founder of a new nation and the Father of a new country which a century after his death has become the most formidable on earth.

Thus, in either case, whether of success or of failure, both gigantic, mankind rates the importance of each by the impress he made upon the events of his time and by its enduring character.

Viewed broadly, the Europe of to-day as compared with the Europe of 1775 is as completely the creation of the popular forces incarnated in Napoleon Bonaparte, as the American Republic of to-day as compared with the revolted Colonies of 1775 is the creation of the popular forces whose exponent George Washington was. From this point of view, the fact that one failed while the other succeeded in the personal sense cuts no figure whatever.

These observations, while they have none other than a general relation to our immediate subject, are pertinent to the main thread of our theme. The real test of greatness in an individual, and therefore of the historical value of

CLIPPERSHIP MORNING LIGHT

his character and career, being the impress he makes upon the events of his time, it follows that, unless the mention of a man's name instantly suggests some great thing or things that he has done, or in a masterful way has helped to do, that man was not great; he made no impress upon his times, and his biography can possess no historic value. But whenever the name of a man stands as the exponent of some great thing done or as the symbol of notable achievement, then the character and career of that man belong to history, and the obligation devolves upon literature to suitably perpetuate his memory.

This, the prime test and condition of enduring fame, has been fulfilled by the subject of this memoir, Charles Henry Cramp. Not alone in his own country, but in Europe and Asia,—from St. Petersburg to Tokio,—the mention of his name instantly suggests triumphs in the science of naval architecture and marine engineering and successes in the art of building ships. However, before proceeding to a history of the career and life-work of Mr. Cramp himself, it seems proper to survey the historical antecedents of his science and his art in his own field of action.

The art of naval architecture and the industry of ship-building were almost coeval with

the primitive establishment of the English-speaking race on the American continent, and this was more particularly true of Philadelphia than of any other place. In the earliest grants of land to settlers, William Penn invariably included a clause requiring them, when clearing the land granted, to "spare all smooth and large oak-trees suitable for ship-timber."

In 1685, three years after Penn arrived in the Colony, it was reported to the Lords of Trade in London that "six ships capable of sea-voyage and many boats have been built at Philadelphia." From this early beginning the industry grew rapidly, until in 1700 four yards were engaged in building sea-going ships alone, besides several smaller concerns which built fishing-boats and river-craft. Two rope-walks, two or three block-makers' shops, and several other special manufactories of ship-building material, had been put in operation. At first the spar-iron work needed was brought from England, but by the beginning of the eighteenth century all the ship-smithing required for Philadelphia-built ships was done on the spot.

The first four yards were located at different points along the beach, between the foot of Market Street and the foot of Vine Street, and

there they remained until about the middle of the eighteenth century. By that time the value of that part of the river front for commercial wharf purposes had increased to such an extent that the ship-building industry could not afford to hold it. In the meantime new yards had been established down as far as South Street, others as far north as the present foot of Fairmount Avenue. Obedient to this law of trade the four older yards moved their plants either northward or southward, as convenience or economy might dictate. But after 1744 no ships were built between Market and Vine Streets. The last of these original shipyards of Penn's time to succumb was the largest and most important one in Philadelphia. It was owned and managed by Mr. West, who was at that time the leading ship-builder in the Colonies; and the ground his shipyard occupied had been deeded to him by William Penn in part payment for a ship he had built for Penn several years before. He removed to the present foot of Green Street.

In 1750–51 two ships were built in West's new yard, which exceeded in size any merchant vessels previously constructed in America. One of them was of three hundred and twenty and the other of four hundred tons burthen. They were sent to England with cargoes of

colonial produce, and on arrival at London were both bought by the East India Company and placed in the regular East India and China fleet. They were as large as any merchant vessels built in England up to that time, and of superior model and construction. One of them—the larger of the two—remained on the list of the East India Company more than thirty years; and in 1751 had for one of her passengers to India, Warren Hastings, who was going out to Madras as a young clerk in the Civil Service, to become the first Governor-General of British India, and founder of the British Empire in Asia.

During this period, the third quarter of the eighteenth century, a new scheme of shipbuilding commended itself to the enterprise and ingenuity of Philadelphia shipwrights. This was the construction of what they called "raft-ships."

The local supply of ship-timber in the forests of England, particularly of frames, knees, keels, and the larger spars, had begun to decline to the danger-point by 1750. The size of ships, both for commerce and for war, was constantly increasing. This increase incessantly involved the use of longer and heavier timbers for frames, larger knees and futtocks, and thicker planking. Meantime the forests of

England became smaller and smaller. The great old trees had been cut down and sawed or hewn up, and the younger stems had not found time to grow in their stead.

Indeed, before 1750, England had begun to import ship-timber from the Baltic; but it was mostly deal boards used for cabin-work, ceilings, sheathings, etc. Now she began to look to her American Colonies for the heavier materials. It was difficult to load and stow this kind of timber through the hatchways of the ships then available. The ingenuity of Philadelphia shipwrights met this obstacle by building the timbers themselves into the form of ships, and they were then navigated across the Atlantic to be broken up on arrival in British ports. These "raft-ships" were built with bluff bows and square sterns, their sides being several feet thick. To make them water-tight, they were sheathed with two thicknesses of boards which "broke joints," and were caulked. The largest of these, called the "Baron Renfrew," measured the equivalent of five thousand tons in a regular merchant ship. She got safely across the ocean, but went ashore on Portland Bill in a fog and broke up. Most of her timber, however, was picked up by English and French vessels which cruised for weeks in search of it. Among the mast-timber

she carried was one white pine tree ninety-one feet long by four feet eight inches diameter at the butt inside the bark. This tree was used for the mainmast of the "Royal George," a three-decker then building at Chatham (1774). It was doubtless still in the ill-fated ship when she heeled over and went down at Portsmouth in 1782. The "Baron Renfrew" was the last of the "raft-ships." The oncoming Revolution stopped all kinds of commerce for eight years, and though after the peace ship-timber was again exported to England, it went as hold or deck cargo in regular vessels.

Summing up the colonial period, it may be said that, while the records were imperfectly kept and some lost, enough is extant to show that between 1684 and 1744 one hundred and eighty-eight square-rigged ships and over seven hundred brigs and schooners, besides immense numbers of boats, river-sloops, fishing-yawls, etc., were built at Philadelphia. Her only rival in the Colonies during that period was Portsmouth, New Hampshire, but Philadelphia held the ascendency over all in the size and total tonnage of her ships.

That the Colonies should have developed the ship-building industry from their earliest existence was natural and necessary. If you take a modern map of the United States and

draw from Maine to Georgia a heavy black line averaging one hundred miles back from the general trend of the sea-coast, you will have in close approximation the geography of colonial settlement at its maximum. In this belt, this "narrow fringe of civilization," were concentrated for more than a century all the energies of English-speaking pioneers, rapidly increasing in numbers and incessantly augmenting the products of enterprise and industry which, from surplus over home consumption, had to seek markets over sea.

In those early days the population kept within easy reach of the coast or of the arms of the sea and estuaries which abound from the Savannah on the south to the Penobscot on the north. The back country, forming the eastern or Atlantic slope of the Appalachian chain, was little more than a hunting and trapping ground or a field for primitive trade and barter with the Indians. As for the vast "hinterland," west of the Alleghenies, it was, up to the middle of the eighteenth century, when the final struggle between England and France for supremacy on this continent began, an unbroken wilderness, inhabited only by hostile savages, and unknown to any white men except the Jesuit priests and the cunning traders of French Canada.

For all these reasons, the gaze of the English-speaking colonists from the earliest settlements to the beginning of the conquest of Canada was always bent toward the sea, and all their enterprise and energy were directed to the commerce of the ocean. Under such conditions, the development of skill in ship-building was inevitable; and with that necessity was also bred a scientific alertness in marine architecture itself which, as soon as political independence freed its scope, became supreme throughout the civilized world.

The outbreak of the Revolution of course, for the time being, put an end to merchant shipbuilding in all American ports. But in Philadelphia the paralysis was only temporary, and the energies heretofore directed toward construction of ships for the uses of peace were soon turned to the conversion of available merchantmen into vessels of war or privateers, and the building of new frigates ordered by Congress. The first American squadron, that of the ill-starred Commodore Esek Hopkins, was composed entirely of merchant vessels taken up in the harbor and converted into men-of-war in the shipyards of Philadelphia during the autumn of 1775.

It was in the selection and conversion of these four merchantmen into cruisers that Paul

Jones, founder of the American navy, first gave to the United States his energies and his talents. Thus Philadelphia was the birthplace of a new sea-power, and her shipyards have ever since been the foremost contributors to its growth, until even now, though only a century and a quarter old, it has achieved imperial rank.

In November, 1775, Congress authorized the construction of six 32-gun frigates and seven other war vessels of less dimensions. Four of the frigates were allotted to Philadelphia shipyards. They were the "Washington," the "Randolph," the "Delaware," and the "Effingham." The first two were frigate-built from their keels, but the "Delaware" and "Effingham," to save time, were built upon frames already on the stocks for merchant ships when the war began. On this account they were not quite as large as the regular frigates and rated twenty-eight instead of thirty-two guns.

From 1775 till the peace of 1783, Philadelphia yards built a great number of privateers and converted a few ships for the "State Navy," as it was called, that is to say, ships provided by the Commonwealth of Pennsylvania and assigned to the Continental service. One of these, a converted bark of two hundred

tons and mounting sixteen 6-pounders, has passed into fame as the "Hyder Ali." Under Lieutenant Joshua Barney she took the "General Monk," a regular sloop-of-war, mounting fourteen 9-pounders and four 6-pounders. The "Hyder Ali" was a small French bark which arrived at Philadelphia with military supplies early in February, 1782. She was at once bought by the State and placed in Humphrey's yard for conversion into a cruiser. Within six weeks she was put in commission, and she took the "General Monk," April 8, about two months after her arrival in port as a merchant vessel. This was the last capture of an English man-of-war in the Revolution.

The peace of 1783 found Philadelphia possessing only thirteen merchant vessels, all built before the war and nearly all of which had served as privateers during the conflict. No new merchant keel had been laid in a Philadelphia yard between 1775 and 1782; but the industry revived with wonderful energy. From 1782 to 1787, one hundred and fifty-five vessels were built, of which fifty-six were square-rigged ships averaging over three hundred tons. From this period on the progress was very great. The outbreak of the wars of the French Revolution in 1793 at once threw a vast carrying trade into American bottoms, the United

States being for a long time the only neutral maritime nation. By the year 1801, when the treaty, or truce, of Amiens was signed, nearly three hundred sea-going ships were owned in Philadelphia, all home-built, and fourteen shipyards were in operation,—eight in the northern or Kensington and six in the southern or Southwark district. These were all first-class shipyards, building the largest full-rigged ships of that epoch. In that period and for a long time afterward the leading Philadelphia shipyard was that of Joshua Humphreys, in Southwark, and its proprietor and manager was himself the foremost naval architect of his time. When Congress, in 1794, authorized the construction of six frigates, and thereby laid the foundation of what we call the modern or "regular" navy, as distinguished from the old Continental navy of the Revolution, prominent ship-builders were asked to submit plans, the government then having no naval constructors. The plans of Mr. Humphreys were adopted for all six frigates. Three of them embodied a distinct advance in size and weight of armament over vessels of similar rate in other navies, and were classed as 44-gun frigates. The other three were designed as 38-gun frigates, and were an improvement upon the 36-gun ships of European navies. These six ships

were built by contract,—one of the forty-fours and one of the thirty-eights at Philadelphia; one forty-four at Boston; one at New York; one thirty-eight at Baltimore, and one at Portsmouth, New Hampshire. In addition to these, a 32-gun frigate, the "Essex," was built at Salisbury Point, Massachusetts, by private subscription, and given to the government.

Mr. Humphreys had the contracts for the Philadelphia-built frigates, and on May 10, 1797, he launched the 44-gun frigate "United States," which was the first ship of the regular navy to be water-borne. Thus to Philadelphia belongs the credit of having fitted out the first squadron of the Continental navy in 1775, and of launching the first ship of the regular navy in 1797. In 1799, Mr. Humphreys completed a third frigate, named the "Philadelphia." This ship is described in some histories as a "forty-four," and in others as a "thirty-eight." As a matter of fact, she was neither; but properly rated, under the rules then in vogue, as a 40-gun frigate. This difference was due to the fact that she carried thirty long 18-pounders on her gundeck as against twenty-eight 18-pounders in the "Constellation" class, or as against thirty long 24-pounders in the "Constitution" or 44-gun class. The "Philadelphia" was beyond ques-

CLIPPERSHIP MANITOU

tion the most perfect frigate of her day. She was the same length as the "Constitution," but of less beam, slightly less draught, and on finer lines. In her design, Mr. Humphreys had sacrificed to speed some of the battery power of the forty-fours, and therefore had to substitute 18-pounders for 24-pounders on the gundeck. She was the fastest sailing war-ship in the world, beating the "Constitution" by nearly two knots an hour. In her first, and unfortunately her last, voyage, from this country to Tripoli, she logged on one occasion three hundred and thirty-two knots in twenty-four hours, and on another three hundred and thirty-seven, the latter run being an average slightly exceeding fourteen knots. She was lost in Tripoli harbor in 1803. It is not too much or too little to say of either that Joshua Humphreys held a professional rank similar to that of Charles H. Cramp, that of the foremost naval architect of his era; and with exceptions, not worth mention, they are the only American naval architects whose designs for sea-going war-ships have been adopted by the navy.

It is worthy of remark in this connection, that when the plans of Mr. Humphreys were adopted in 1794–95, the government not only had no naval constructors of its own, but in

fact no Navy Department, except a Bureau in the War Department, so that Mr. Humphreys could have no competitors but other private ship-builders. Mr. Cramp's designs, however, have been adopted under the scrutiny of a highly competent and most critical corps of regular naval constructors and marine engineers.

The renewal of general war in Europe in 1803 gave a fresh impetus to the neutral carrying trade of the United States, and with it a corresponding stimulus to ship-building all along the coast, though most pronounced and on a larger scale at Philadelphia than elsewhere. Between the above date and 1812 nine more shipyards were established, making twenty-three all told in operation at one time. The largest merchant vessel up to that time built in America was one of seven hundred and five tons, constructed by Samuel Bowers for the East India trade, and her dimensions were not exceeded in merchant construction until after the War of 1812–15. Her contract price was $24,000; at the rate of $34 per ton gross measurement. At that time vessels of similar class cost ten guineas ($50) per gross ton in British shipyards.

In a public document on the statistics of ship-building, we find a statement that "in

June, 1787, the ship 'Alliance,' owned by Robert Morris and commanded by Captain Thomas Read, sailed from Philadelphia for Canton and Batavia. She was of seven hundred tons burthen, and the largest ship built for commerce in America at that time."

The statement that the "Alliance" was "built for commerce" is an error. She was the famous old Revolutionary frigate which Paul Jones and John Barry had commanded at different times. After the peace of 1783 she was sold to Mr. Morris, or rather turned over to him in part payment for advance he had made to the Continental government. She was converted into a merchant ship and made several China voyages. The government then bought her back again in 1790, but she was not refitted as a war vessel.

During the general period under consideration, that is to say, from the end of the Revolution to the beginning of the War of 1812, a new and highly important deep-sea traffic came into existence, of which Philadelphia soon obtained the supreme command. This was the East India and China trade. The first vessel to clear from Philadelphia for China direct was the new ship "Canton," built by Humphreys and commanded by Captain, afterward Commodore, Thomas Truxtun.

This was the same Thomas Truxtun who, during the Revolution, had seen more service in privateers than any other sailor then afloat. He served either as mate or commander in the Philadelphia privateers, "Andrew Caldwell," "Congress," "Independence," "Mars," and "St. James," from 1775 to 1782. His ships made altogether sixty-five captures of British merchantmen and transports. While commanding the "St. James," of twenty guns, in 1781, he beat off and disabled a British 28-gun frigate. After the Revolution he commanded Philadelphia Indiamen from 1785 to 1798, when he was commissioned one of the original six captains in the regular navy. In the short war with France in 1799 he commanded the "Constellation," 38-gun frigate, and took the French frigate "l'Insurgente," of forty guns.

The "Canton" sailed from Philadelphia on December 30, 1785. She returned in May, 1787, having made the round voyage to Canton, Batavia, and home in a little over sixteen months. Her venture was highly profitable. From this beginning the far eastern trade grew steadily until, in 1805, Philadelphia alone owned twenty-seven ships plying in it, ranging from four hundred and twenty to seven hundred and five tons. Between 1805 and 1812, inclusive,

the number of Philadelphia Indiamen and China ships increased to forty-two, notwithstanding the injurious effect of President Jefferson's ill-advised embargo. In fact, that measure was not much observed by ship-owners in the India and China trade. President Jefferson did not attempt to enforce his embargo by either civil or military power, and very soon after he proclaimed it, the understanding became general among merchant ship-owners that if they chose to take the risks entailed by the British "Orders in Council" and Napoleon's "Decrees of Milan and Berlin," they could do so at their peril, with no recourse for protection or indemnity in case of misfortune. Under these conditions, ship-owning merchants, in other coast cities who traded with European or West India ports, for the most part hesitated to take the chances. But the Philadelphia merchant princes, who controlled the American trade with the British and Dutch East Indies and China, were not so easily foiled. They loaded and despatched their ships during the embargo, a period of nearly two years, almost as freely, if not as ostentatiously, then as they had done before or as they did afterward. This policy was founded upon the soundest judgment. The India and China merchants of Philadelphia understood perfectly that the titanic

struggle between England and Napoleon involved conflicting policies and ambitions relating only to the commerce between America and Europe, not to that between America and the Orient. Occasionally an American ship bound for India or China or thence for home would be brought to by an English or a French cruiser and searched. But, as those ships never carried anything contraband of war, the worst that ever happened to them was the occasional impressment of parts of their crews by the English or the levying of a small tribute by the French. The voyages, as a whole, were seldom interrupted, and almost never terminated by detention or capture. These were the halcyon days of Philadelphia's trade with the far East. From 1803 to 1815 the French could not trade to the Orient at all. And though the East India Company kept up the sailings of its fleet with more or less regularity, yet the war rates of insurance and the expense and inconvenience of constant convoy placed their traffic at signal disadvantage as compared with that of the neutral Americans.

The Philadelphia-built Indiamen and China ships of that day had another and even more important element of safety: Given plenty of sea-room and clear weather, with sailing wind,

no British or French cruiser of their time could get anywhere near them.

For example, the "Rebecca Sims," built by Samuel Bowers in 1801, and overhauled, coppered, and newly sparred and rigged in the winter of 1806–07, passed Cape Henlopen the 10th of May, 1807, and took a Liverpool pilot aboard off the mouth of the Mersey the 24th, having run from the Delaware Capes to the Mersey in fourteen days. Notwithstanding all the improvements in clipper ships after her time, the "Rebecca Sims" still holds the sailing record between Henlopen and Liverpool!

The "Woodrup Sims," built for the same owner by Mr. Humphreys in 1801, was chartered for the China trade in 1808. She passed out of the Capes the 8th of April and anchored in Whampoa Roads, Canton, the 6th of August, one hundred and seventeen days from the Delaware. But from this must be deducted two days hove-to in Table Bay, Cape of Good Hope; three days in port at the Isle of France (now the Mauritius), and two days hove-to in Angier Road, Java Head, the actual running time having been one hundred and ten days. Manifestly, ships capable of that kind of sailing had little need to fear the cruisers of England or of France.

To give an approximate idea of the value of

Philadelphia's East India and China trade in its halcyon days, it may be related that in the autumn of 1812 the ship "Montesquieu," belonging to Stephen Girard, left Canton for the Delaware *via* Batavia. At the latter port she took on board, in addition to her China cargo from Canton, a rich freight of spices. She left Batavia before the news of the War of 1812 reached there. Her commander had intended to touch only at the Cape of Good Hope on his voyage home, that being a British colony. But when about five hundred miles east of the Cape he spoke a Portuguese vessel bound for Macao, whose captain informed him that England and the United States were at war. He then ran for Tristan d'Acunha, where he obtained needed supplies of water and wood, with such fresh provisions as the island afforded. Thence shaping his course homeward he arrived off the Capes of the Delaware in April, 1813. There she was brought to and taken by the British frigate "Tenedos." But Mr. Girard was on the alert, and, judging about the time she ought to arrive, had been waiting for her in a cottage he owned at or near Lewes, and she was taken in plain sight of the shore. He at once put off in a pilot-yawl under a flag of truce, boarded the British frigate, and after some parley succeeded in

ransoming the "Montesquieu" for £37,000 sterling in specie bills on London! He then took his ship up the river to Philadelphia. The blockade had raised the value of China and East India products enormously in the American market, and Mr. Girard realized the handsome sum of $1,220,000 from the sale of her cargo over and above the $185,000 he had paid as ransom. He was also offered a large sum for the ship herself to fit out as a privateer, but part of his agreement with the British captain was that she should not be used for that purpose, and so she was laid up during the rest of the war.

Upon the conclusion of peace in 1815, the India and China trade of Philadelphia was renewed with great vigor, and ship-building became more brisk than ever before.

The war had nearly obliterated the whaling fleet of New England and New York. Unable to replace those lost or destroyed as quickly as they desired in their own ports, the whaling owners resorted to Philadelphia, and in the seven years between 1815–1822 sixty-four ships, ranging from three hundred to four hundred tons, were built on the Delaware for the whale fishery to hail from New Bedford, Nantucket, New London, Sag Harbor, and other whaling ports. A peculiarity of these

transactions was that most of the contracts for building whale-ships were taken by New England builders and then sublet to Philadelphia yards.

At the same time, that is, in the decade following the peace of 1815, a new element of ocean commerce came into being. This was the inauguration of regular packet-lines. The pioneer of this enterprise on any considerable scale was the famous "Cope Line," founded by Thomas P. Cope in 1820, and employing at first five ships which were among the largest and best vessels then afloat. This line continued to run until the Civil War. Its ships were from five hundred and sixty to one thousand two hundred and eighty tons. They sailed from Philadelphia the 20th of each month and from Liverpool the 8th, their trip-time averaging thirty days and being almost as regular as the modern steamship lines. In addition to this regular monthly service, extra ships were frequently despatched as the exigencies of trade and travel might require.

Mr. Cramp, in one of his reminiscences, relates an interesting anecdote of the Cope Line. Soon after Jackson was inaugurated President, he appointed John Randolph, of Roanoke, Minister to Russia. The Cope Line being then far ahead of all other channels of ocean

travel from Philadelphia to Europe, Mr. Randolph presented himself at its shipping-office. In his usual grandiloquent manner he said to the first man he encountered: "Sir, I want to see Thomas P. Cope." He was shown to Mr. Cope's office, and said to him, "I am John Randolph of Roanoke. I wish to take passage to Liverpool in one of your ships." Mr. Cope replied, "I am Thomas Cope; if thee goes aboard the ship and selects thy state-room and will pay $150, thee may go." Mr. Cope apparently could see no reason why a Philadelphia ship-owner and head of a great packet line should stand in awe of even a Virginia statesman.

About 1828–30 the India and China trade of Philadelphia suddenly declined, and in a few years passed almost entirely into the hands of New York and Boston. In a historical paper, Mr. Cramp describes the conditions of this traffic at its zenith, and suggests the cause or causes of its remarkable decline.

The custom, he says, was upon the arrival of the vessels to announce in the papers not only of Philadelphia but also of New York, Boston, Baltimore, and even less important cities, that the goods would be sold at auction, to begin on a certain day. These auction sales brought great numbers of merchants from other cities

to Philadelphia, and during the first quarter of the nineteenth century it was beyond doubt the most profitable single line of traffic on the continent. The merchants engaged in it were not mere buyers and sellers as the term is understood now. They were important public characters, diplomatists and financiers, and their influence extended to the remotest parts of the earth. They amassed enormous fortunes and lived like princes. Some of them, either singly or in associations, owned fleets that would compare favorably with our then existing navy in numbers and tonnage. At its highest development, say, between 1825 and 1836, the volume of Philadelphia's Oriental trade frequently reached sixty millions a year.

Finally, however, causes began to operate which gradually changed the tide of affairs. These causes, as stated in the historical paper by Mr. Cramp, were numerous. Among them was the fact that, as the original merchants who had built up the trade grew old or died, their immediate heirs or descendants did not care to carry on the enterprises of their fathers or their grandfathers, and many of them lived permanently abroad. Eventually, at the moment when the jealousy, envy, and ambition of rivals, particularly in New York and New England, had reached the critical stage,

CRUISER YORKTOWN

the Legislature of Pennsylvania enacted a law imposing a certain tax on all auction sales within the State. This was a tax ostensibly universal and covering the whole business of sales by auction, but its real purpose was to get at and derive revenue from the great auction business of the China and India trade of Philadelphia. In those days it might easily happen that the auction sales of two or three ships' cargoes would exceed in value, and therefore in revenue, all the rest of the auction sales in the State at large during the same time.

Of course, this was a development of a tendency on the part of the rural or country legislator of that time, which unfortunately has not entirely died out, to tax the great cities by special enactments for the benefit of the general revenue of the State.

As already stated, other causes had for some time been operating to weaken or shake Philadelphia's supremacy in the Oriental trade, but the imposition of this tax, falling upon the heels of those causes, proved to be the last straw that broke the camel's back. The result was that between 1825 and 1836 the great India and China traffic of Philadelphia almost disappeared. However, and notwithstanding the diversion of this trade to other ports, princi-

pally in New England, the marine architects and ship-builders of Philadelphia managed to retain the better part of the construction of vessels, which for many years afterward were employed by their successful rivals.

This somewhat extensive and discursive survey of the early colonial and post-Revolutionary conditions of Philadelphia ship-building seems requisite to a proper understanding of the state of the art and its accompaniments at the time when the subject of this Memoir first appeared upon the scene, and it also serves to indicate or explain what he had to do and the prior achievements which he had to equal or excel in his pursuit of professional success and eminence.

CHAPTER II

Birth—Relatives—High School—Magnetic Observatory—Note on Davidson—Surf-boats for Mexican War—First Propeller Tug "Sampson"—Ship-builders of New York and Philadelphia—Clipper Ships, 1850—Zenith of American Carrying Trade—Crimean War—Cunard Line—"Libertador"—Armored Ships—Board Appointed to Take Charge of Appropriation to Build Them—Account of "New Ironsides"—The "Monitor"—Speech of Bishop Simpson—Sub-Department of Navy—Light-draught Monitors—Sinking of the First—Collapse of Sub-Department—Rebuilding of "Yazoo," "Tunxis," and others—"Miantonomah"—Origin of Fast Cruisers—Evolution of Modern Marine Engineering in this Country.

CHARLES HENRY CRAMP was born May 9, 1828. He was the eldest son of William Cramp and Sophia Miller. At the time of his birth his father was a master shipwright, not yet engaged in ship-building on his own account, or at least not the proprietor of a shipyard.

The Cramp family are of the old German descent, and they were among the first settlers on the banks of the Delaware. The name was Krampf up to the Revolution, when, according to the fashion at that time, it was anglicized. They came from Baden.

The fact that the art of ship-building "ran in the blood" may be judged from the fact that in 1788 Paul Jones, commanding the Russian Black Sea fleet during the Turkish war of that period, under the reign of Catharine the Great, says in his journal that among the foreign employees of the Russian Ministry of Marine was a naval architect named John Cramp, who held the position of secretary to the Russian Black Sea administration and had charge of the dockyard which had been established at Kherson.

The Millers and Byerlys of the mother's family were also ship-builders. Mr. Cramp's maternal grandfather, Henry Miller, who had become proficient as a shipwright, at twenty-one invested his small fortune in an interest in the cargo of a vessel in one of the earliest voyages after the Revolution from the port of Philadelphia to the East, taking in China, the Indies, and the Philippines. His departure was witnessed by his fiancée, Elizabeth Byerly, who waited faithfully and patiently his return.

These vessels were fitted out "man-of-war fashion," with the captain and mates, carpenter and boatswain as officers, and the latter were the battery commanders.

They always carried a supercargo, and sold the cargoes at the various ports and invested

the proceeds in China shawls, teas, spices, and other products of the East.

At that time the waters of the East Indies and China swarmed with adventurers, pirates, rovers, and privateers; and the armed merchantmen had frequent brushes with them. In fact, many merchantmen of that time became imbued with the restless, adventurous spirit of the age and, commanding vessels heavily armed, took possession of some of the weaker ships they encountered, becoming veritable pirates for a time, and then returning to their homes under peaceful guise when the profits of their voyage had reached a satisfactory figure. The foundations of many fortunes in our Atlantic cities were laid upon such practices.

Mr. Miller embarked again with his augmented capital, in fact, making four voyages, each time with the profits of previous voyages in the new one, encountering many adventures with the pirates that infested the waters of the East and with an occasional privateer.

It was on his return from the fourth voyage when he, with the accumulations of his original venture sufficient to secure a life of ease and comparative luxury, and eager to meet his fiancée, who would be patiently awaiting his arrival, was in sight of Cape Henlopen, with the full assurance that his voyages were ended and

with every anticipation of a happy consummation of his eager wishes, a large privateer carrying a French flag hove in sight in a position of advantage.

The privateer, carrying a heavier armament and larger crew, captured the vessel before she could get inside of the Capes, and took the whole party to Martinique, where the whole property was confiscated and all the crew and officers were put in jail.

Mr. Miller, who was a Mason, was astonished to find that the French jailer was also one, and, as a mark of kindness, took him out and made a body-servant of him. His ingenuity and adaptability to circumstances enabled him to escape, and he reached Philadelphia without a cent and but little raiment. When Elizabeth Byerly was seen next day on Point-no-Point Road in a buggy with him, she looked as happy as if fortune was already in her hands. When they were married the next day, a serviceable loan from a friend facilitated the marriage festivities.

His restless, adventurous spirit, augmented by his voyages at sea, now took a different turn, and his time was taken up by trips from Pittsburg to New Orleans in arks that he and his companions built in Pittsburg, and with cargoes of produce and other freight they

floated down the Ohio and Mississippi, relieving each other at steering or playing the violin and taking an occasional shot at a deer that would be found swimming across the river. The rivers Ohio and Mississippi ran through a wilderness at that time, and its fascinations had a wonderful effect on him.

After the cargoes and the lumber of which the arks were built were sold and the proceeds lost in speculation, they would make their way up to Natchez or other river towns, where they would be sure to get a steamboat or a flat boat or two to build, and then return to Philadelphia for a while. Henry Miller became well known on the rivers, and could always secure a commission to build the various craft that were found in the waters of the West.

One of Henry Miller's sisters married John Bennett, a ship-builder of repute, who went to live in Bordentown while engaged with his sons at Hoboken as shipwright and ship-builder for the celebrated Stevens family. It was there that with other vessels they built the yacht "Maria," named after the wife of John Stevens. The building of the "Maria" was an event, and Maria Stevens spent most of her spare time at the yard in looking over her construction and finish. The Stevens battery was begun during the Bennett period.

Mrs. Miller's brother was John Byerly, and her sister married William Sutton, both noted ship-builders. So when William Cramp, who had learned his profession under Samuel Grice, married Sophia Miller, two families of ship-builders were united.

Charles H. Cramp was two years old when his father acquired frontage on the Delaware in Kensington and established a shipyard of his own.

This early enterprise of William Cramp, who was then twenty-three years old, has since grown to be the great establishment known as The William Cramp & Sons Ship and Engine Building Company.

It does not seem necessary here to recount the progress of that pioneer enterprise. Suffice it to say that at the time when William Cramp founded his shipyard it was one of fourteen on the Delaware at different points on the river front between Southwark and Kensington, and it is the only one of the fourteen that remains in existence.

Of Charles Henry Cramp's childhood and early youth, it is not necessary to speak here in detail. He was, it might be said, born into the atmosphere of naval architecture and the art of ship-building, and from his earliest ac-

tivity he never practised or attempted to practise any other profession.

When about fourteen years of age he had exhausted the educational possibilities of the ordinary schools and entered the old Central High School, which was then presided over by Alexander Dallas Bache, the most consummate master of the science of applied mathematics and the physical sciences of his time in this country, if not in the world. While at the High School, Mr. Bache was appointed to take charge of the appropriation of a million dollars by Congress to defray the cost of a series of observations on terrestrial magnetism in cooperation with similar observations along the same lines in Europe, and also for the purpose of making certain observations in meteorology. The appropriations for the last-named observations were made on the recommendations of Professor Espy. This was about 1846.

While Washington was the central point of the observations, Philadelphia was practically the head-quarters, because Professor Bache and his associate, Major Bache, resided there.

Observations were established at Charleston, New Orleans, and Utica, and they communicated with Toronto, the Canadian station.

Professor Bache took his observers at Philadelphia from among the pupils of the High

School for night work, and he had the day observers from the University.

George Davidson, Charles H. Cramp, and William H. Hunter were among the number, and the observations, after being collated at Washington, were ultimately deposited at the Smithsonian Institute, and later on formed the basis of the operations of the "Signal Service Bureau." At the time the observations were made, the magnetic telegraph had not as yet been utilized, and the course of storms was portrayed by mail after they had occurred.

Not long after this period, Professor Bache was appointed to succeed Mr. Hasler as head of the Coast Survey. He invited the young men who were in the group of the magnetic installation to accompany him in his new field of labor, and Mr. Cramp was invited with the rest, but desiring to engage in ship-building he pursued that art.

Mr. Davidson, who was in the magnetic observations with Mr. Cramp, and was a schoolmate and life-long friend, remained on the Coast Survey under Mr. Bache, and spent the greater portion of his life on the Pacific in that capacity; and it was under his direction and control that the great Triangulation of our newly acquired possessions there from the Rocky Mountains to the coast was made by

him, and said to be by scientists the greatest work in geodesy ever made by or under one man.

He is now Professor of Commercial Geography in the University of California. He has filled nearly every position there that required the highest attainments in the physical sciences. The Alaska Commission, inauguration of Lick Observatory, expeditions for the observation of eclipses of the sun, are a small portion of the important positions that he has filled. His contributions to science would fill volumes.

At the end of a term of three and one-half years under the tutorship of Professor Bache, Mr. Cramp entered the shipyard of his maternal uncle, John Byerly. This arrangement was made, notwithstanding the fact that his father, William Cramp, was then actively engaged in ship-building on his own account; the idea being that it would be better, all things considered, for him to begin his practical experience under other tutorage than that of his own father.

About 1846, or in his nineteenth year, Mr. Cramp, having attained to a certain point the qualifications of a practical ship-builder in his uncle's shipyard, went to that of his own father.

Among the first things undertaken when in his father's yard, Mr. Cramp designed the pioneer propeller tug-boat ever built in the United States, the "Sampson," and it fixed the type now so numerous in the waters of America. She was of a peculiar build. Her dimensions were eighty feet long and twenty feet beam. She had as much dead rise as a pilot-boat or "pungy," and had a keel three feet wide at the stern-post. In getting up the design, it was considered indispensable by the marine engineers at that time to have the screw entirely beneath the bottom of the vessel, and, as the screw was six feet in diameter, the engine-builders wanted the keel six feet wide. When shown the impracticability of this, they were content to have three feet of the screw beneath the bottom of the ship. The propeller shaft ran on top of the floors and the bearings were between the frames. The crank was between the frames and just cleared the outside planking in its sweep. She proved to be a profitable investment for the owners, Michael Molloy & Son, who ordered another one. This was the "Bird." She had a narrower keel, and the bearings of the propeller shaft were secured to the top of the floors. Another one was built a short time after, and, in view of the shallow water in which she had to run,

MONITOR TERROR

the keel was only ten inches wide. This was considered a great detriment to the efficiency of the screw; but on the trial it was found that the importance of wide keels was overestimated, and the practice came to an end.

A considerable operation of unusual and interesting character was undertaken by his father about that time, and in which Mr. Cramp himself assisted. This was the design and construction of a fleet of surf-boats intended for the purpose of facilitating the landing of General Scott's army at Vera Cruz. The naval and military authorities of that time were doubtful of the capacity of the ordinary boats of the fleet itself to land a sufficient body of troops at one time to command the shore. The intention at first was to provide a sufficient number of boats to land the whole army at once, and three hundred boats were contracted for upon a design made by William Cramp.

Only a part of them was built by Mr. Cramp, but they were all built upon his plans. They were large surf-boats of three different sizes, and were carried to Vera Cruz on the decks of schooners chartered for the purpose. The thwarts were taken out of the larger boats and the smaller ones of different sizes were stowed in them.

The "Standard History of the Mexican War" shows that out of the total number (three hundred) designed by Cramp and contracted for with different boat-builders, only one hundred and eighty-six (186) were actually delivered and used, and in the operations against Vera Cruz, General Scott's army was landed by divisions. The Regular Division commanded by General Worth was put on shore first, then the Volunteer Division of General Robert Patterson, and, finally, the mixed Regular and Volunteer Division of General Twiggs.

After these boats had been used for their original purpose they were cast adrift. Their sea-worthiness may be estimated from the fact that some of them were picked up in mid-Atlantic months afterward.

There are stories in history about invading armies burning their bridges behind them, but this is unquestionably the only instance where an army deliberately cast loose the boats in which it had landed upon the soil of an enemy. Burning bridges might mean, and doubtless would, the simple destruction of means of re-crossing a river in the case of disaster, but the destruction or dispersion of the boats in which Scott's army landed at Vera Cruz meant the obliteration of any possible means they might

have had of crossing a gulf and ocean had the fortune of war been adverse to them.

Starbuck, in his "History of the American Whale-fishery," refers to this incident, and says that some of these boats were picked up by whaling-ships, whose crews highly prized them, and that they were used for years afterward in the sperm and right-whale fisheries of the Pacific Ocean.

At the beginning of the career of Mr. Cramp in ship-building, the profession had arrived at its highest state of efficiency in everything that related to the design, finish, and outfit of ships. They were with but few exceptions all of wood, and it was in the wooden ship and during the period between 1840 and 1860 that the art and everything belonging to it attained its highest proficiency. Ship-building as an art, profession, and science culminated about this time,—the great transition from wood to iron.

From the earliest period up to that time the professional ship-builder or "master builder," as he has always been called, was a master in reality. He designed, modelled, and built his own ships, and his appreciation of the beautiful and his artistic taste were of the most refined and cultivated character, and were everything that the term sculptor, artist, and constructor meant. He was acutely sensitive; his

contempt for the quack and commonplace in his profession was as great as that of the physician in regular practice for the medical quack.

The builder, the shipwright, the commander, and sailor of this period have never been equalled in any of their professions since, and with but few exceptions the modern steel ship is a retrograde in everything pertaining to the real art as compared to the ship of the period we refer to. The ships, of course, are larger now, and that is all. This period was not only noted on account of the high character of the art, but ship-building plants in New York, Philadelphia, and Baltimore turned out the finest specimens of construction in the world. All of the workmen—shipwrights, ship-joiners, ship-smiths, ship-painters, and caulkers—were without equals on the planet.

The Webbs, the Westervelts, the Steers family, Jere Simonson, Smith and Dimon and others of New York, and John Vaughan, John Byerly, the Van Duzen family, John K. Hammett and William Cramp, of Philadelphia, were the leaders of their profession the world over. In the navy were to be found the Grices, the Humphreys, the Hanscoms, Delano, and others.

The introduction of the iron ship was made under very unfavorable conditions. The first

to take hold of the new material were people, mechanically speaking, of commonplace character both here and abroad, and the art or profession as a rule retains the original taint up to this time. There are some exceptions; some ship-builders in Great Britain carried their art into the Iron Age,—the Napiers, the Ingliss family, and others in Great Britain, and the Cramps in the United States.

Mr. Cramp's mould loft practice and methods as carried on from the wooden-ship period is the practice now in use in the construction of the navy.

The great advance in the steamship of the period thence up to this time has been in the machinery; and in marine engineering the English were our masters. There has been no advance here in the ship-building art in any respect.

The decade following the Mexican War and preceding that of the Rebellion was marked chiefly by the final or ultimate development of the clipper type of sailing-vessel, and also by the gradual surrender of sail to steam in propulsion and of wood to iron in construction. The clipper idea was undoubtedly of Baltimore origin, and, in fact, the name of that city was given to the type,—the "Baltimore Clipper." They were, of course, sailing-vessels. In all

respects of model, of structure, size of spars and sails, dimensions of hull, etc., the type was distinctly American. It is known, however, that the earliest clippers built in Baltimore were intended for and used in the African slave-trade. In this nefarious traffic they were extremely successful, because in the day of their beginning there were no steam cruisers to enforce the laws making the slave-trade piracy, and there was no sailing cruiser afloat which could keep within sight of a Baltimore clipper in the slave-trading days.

The type, though originating in Baltimore, was not developed there to its ultimate capacity, but the idea was taken up by Philadelphia, New York, and New England ship-builders and embodied in the famous lines which plied between this country and the Pacific Ocean. The discovery of gold in California also gave a great impetus to commerce in sailing-vessels. Of course, steamships soon began to run from New York to the Atlantic side of the Isthmus and from the Pacific side to San Francisco, but there was no railway across the Isthmus at first, so that very little freight traffic could be handled by these steamers. The result was that all freights between the Atlantic coast and California had to go around

Cape Horn, and in this traffic the clipper ship fully asserted its value.

The decade of the 50's was really the zenith of the American carrying trade on the ocean. Relatively to the total amount of ocean commerce, our ships carried a larger proportion of it than ever before in time of peace. Of course, during the Napoleonic wars, when our flag was neutral, we carried a larger proportion of our own products than in the 50's, but never before in a time of general peace.

The Crimean War, which happened during this period, also helped American commerce in the ocean carrying trade, because the French and English took up a great deal of their tonnage for transporting troops and military supplies during the years 1854, 1855, and 1856, and to a great extent the places of these ships were filled by vessels under the American flag.

All these causes combined to create marked activity in American ship-building.

To this might be added the effort to establish a trans-Atlantic steamship line under the American flag in opposition to the heavily subsidized Cunard Line. This was known as the Collins Line, and while the government aid lasted it held its own in competition with its British antagonists, but the subsidy was soon

withdrawn, and with it the Collins Line collapsed.

On the whole, so far as American ocean commerce and ship-building are concerned, the decade of the 50's was one of the most interesting in our history. During that period the Cramp concern built from the designs and under the superintendence of Charles H. Cramp a considerable number of important sailing merchant vessels, together with several steamers, mostly constructed for the coasting trade between the ports on the Atlantic and on the Gulf. Cramp also built during that period seven steamers for Spanish or Cuban account to be used in the coasting trade of the Spanish West Indies. They were called "Carolina," "Cardenas," "Alphonso," "Union 'Maisi,'" "General Armero," and "Union No. 2." The last one was not finished until the outbreak of the Rebellion, when she was taken possession of temporarily by the government and converted into a gun-boat, now in the navy list as the "Union." An interesting incident in Mr. Cramp's career was his visit to Havana for the purpose of delivering these ships. In their delivery and in making settlement for their construction he spent several months at Havana, where his knowledge of the Spanish

language, in which he always retained considerable proficiency, was of great service to him.

The first war vessel designed by Mr. Cramp was the "Libertador," built for Venezuela. She was fitted with a pair of trunk engines by Messrs. Sutton & Smith, who were noted for their skill in building trunk and oscillating and other marine engines. She mounted a large pivot-gun on her quarter-deck, and when fired off on her trial trip at Market Street, the windows there were broken and the gun nearly kicked herself overboard.

We now arrive at the period of the Civil War, in the operations connected with which Mr. Cramp's genius first became conspicuous in the broad or national sense.

The work hitherto described, although important in its time and place and under its conditions, which were those of peace, had really served little more than the purpose of a practical training-school to fit him for the broader and more comprehensive duties and responsibilities which the exigencies of the Civil War imposed.

At the outbreak of that struggle, optimistic statesmen, like Mr. Seward, dreamed that it would be over in ninety days. Those dreams went up in the smoke of the first Bull Run.

Then the authorities at Washington awoke to the fact that they had on their hands a long and stubborn war.

It is a fact not generally known, or usually lost sight of, that during the first six months of the Civil War, that is to say from April to September, 1861, inclusive, the South raised and embodied a larger number of troops than the North did, and the scale in that respect did not turn until the government had begun to realize the results of its call for five hundred thousand men. But the problem that confronted our authorities was not military alone. It soon became clear to sagacious minds that a great sea power must be created as well as an overpowering force by land. It was a foregone conclusion that notwithstanding the great numerical disparity between the white population of the South and that of the North, —the proportion being about six millions in the South to twenty-five millions in the North, —it would be impossible to overcome them so long as their ports remained open. If the Southern people could continue without serious hindrance to exchange their cotton for European, principally English, arms, ammunition, military supplies, and munitions of war of all kinds, together with provisions and clothing of the kind which they had habitually im-

ported, their armies could keep the field; their railroad system could be kept in fair running order, and the numerical superiority of the North must thereby to a great extent be neutralized. Therefore an effective blockade became an immediate and absolute necessity.

The total coast-line of the Confederacy, Atlantic Ocean and Gulf together, was three thousand six hundred miles long, measured in straight lines. The shore-line, or sinuosities, was considerably more than twice that length. It is a coast indented with numerous inland bays and estuaries, affording easy access to the immediate interior and safe refuge for their ships or the ships of those with whom they traded. Of course, a mere blockade by proclamation would not be respected by any foreign maritime power. Paper blockade so-called had been ruled out of consideration years before in solemn congress or conference of the Great Powers.

At that moment our navy was at its lowest ebb, and, of the few ships available for immediate service, many were on foreign stations and could not easily or quickly be recalled, as the cable system of communication was then unknown.

The task therefore became that of immediately improvising a navy capable of en-

forcing a real blockade. To accomplish this, before the end of 1861 every steamer of every description that could keep the sea or carry a gun was pressed into the service, and our commercial fleet, so far as steam navigation was concerned, ceased to exist.

These converted vessels served a fairly good purpose *ad interim*, or until the government could bring its resources to build a more effective fleet of regular men-of-war.

In addition to this necessity for the immediate improvisation of a blockading fleet, the question of armored vessels presented itself, because, besides the blockade, bombardment of sea-coast fortifications which had been seized by the Confederates must be an essential part of the general plan of operations.

The idea of armored ships was then entirely novel. In 1861 only two efforts had been made, one by England and the other by France, to construct an *armored sea-going vessel.* To meet this necessity of having ships capable of attacking heavily armed forts, Congress passed an act, approved August 3, 1861, authorizing the construction of armored vessels. This act authorized and directed the Secretary to appoint a board of skilled naval officers to investigate plans and specifications that might be submitted for the construction

CRUISERS BALTIMORE AND PHILADELPHIA

of iron- or steel-clad steamships or steam floating batteries; and, on their favorable report, authorizing the Secretary to cause one or more armored or iron- or steel-clad steamships to be built, making an appropriation of $1,500,000 to carry the act into effect. Pursuant to this act, the Secretary appointed on August 8 a board consisting of Commodore Joseph Smith, Commodore Hiram Paulding, and Commander Charles Davis, to examine such plans as might be submitted, and issued an advertisement, under date of August 7, calling for plans and prices. The advertisement stated that a general description and drawings of the vessels' armor and machinery, sufficient to indicate the character and probable efficiency of the vessel, would be required; also that the offer must state the cost and time for completing, exclusive of armament and stores, the rate of speed proposed, etc. Persons proposing to make offers under this advertisement were required to inform the Department of their intention before the 15th of August, and to have their propositions presented within twenty-five days from the date of the advertisement.

On September 16, 1861, the board reported that seventeen offers had been laid before them. All but three, however, were ruled out, mainly on account of insufficiency of data or

lack of drawings. Several of them were, in fact, mere suggestions.

The three selected were: First, one to be built of wood and plated with four inches of iron; to be a full-rigged ship of about three thousand three hundred tons displacement; price, $780,000; length of the vessel, two hundred and twenty feet; breadth of beam, sixty feet; depth of hold, twenty-three feet; contract time, nine months; draught of water, thirteen feet; speed, nine and one-half knots.

The second, offered by C. S. Bushnell & Co., of New Haven, was of the low freeboard monitor type, the invention of which is commonly ascribed to John Ericsson; and the third, offered by same parties, which was afterward known as the "Galena."

The first vessel described afterward became the "New Ironsides." Her hull was designed entirely by Mr. Cramp. Generally speaking, her type was that of a broadside sea-going iron-clad. She was a roomy, comfortable ship for her officers and crew. Her fighting quarters were well protected against the shot of that day. Although engaged with forts and batteries a greater number of times than any other one vessel in the service, her armor was never pierced.

Perhaps at this point a description of the

vessel and the conditions attending her construction, in the form of a paper read some years ago by Mr. Cramp before the Contemporary Club, of Philadelphia, will be more pointed and interesting than any other delineation.

It is as follows:

"NEW IRONSIDES"

"When the 'New Ironsides' was contracted for there was no white oak timber available outside of Pennsylvania. Timber of this kind was cleaned out in Delaware and Maryland, and Virginia was for the time-being inaccessible. So the timber that must be used was growing in the forests of Pennsylvania when the contract was signed.

"With the exception of pine decking every stick of timber was of white oak, and being the largest wooden ship ever built, the frames were very heavy,—the floor timbers were two to each frame, and, being without first futtocks and running from bilge to bilge, they required a tree large enough to be twenty-two inches in diameter at a height of forty-five feet from the ground. Trees of this kind were very scarce in Pennsylvania, and frequently only a single tree would be found in a township, which had been preserved as an heirloom by the owner, and it was often difficult to persuade him to sell.

"During the month of October, 1861, we advertised in the country papers that we would pay a dollar a running foot for every tree that was brought to us by the first of January, under the requirements that they were to be at least twenty-two inches in diameter at forty-five feet

from the ground, and the logs were to be sided on two sides anywhere from thirteen inches up to eighteen inches.

"At this time, the beginning of the war, farming and business in country towns being very slack, all suitable trees in the forests of Bucks, Berks, Delaware, and Chester counties and some counties more remote were prospected by the country-people and farmers, who worked very hard utilizing moonlight nights as well as daytime in cutting and shipping this timber. These counties were traversed by the North Pennsylvania Railroad, and the various stations from Quakertown down were soon gorged with logs that had to be delivered at our shipyard on or before the first of January to meet our requirements. By the first of January we had logs sufficient to make all the floors of the ship, and quite a number were left at the stations where they had accumulated too rapidly for the railroad to handle them, and they could not be delivered within our time limit. This timber was afterward bought at a reduced price.

"Not being able to get yellow pine, the beams and water-ways were made of white oak. Some of these pieces were sixty feet long and were sided up to sixteen inches. But notwithstanding these difficulties and the fact that all the frame-timber was standing in the forest when we took the contract, yet the vessel was launched in six months after it was signed.

"The region traversed by the North Pennsylvania Railroad in furnishing the frames, water-ways, and beams became exhausted in its turn, so that toward the termination of the war white oak for the beams of the light-draught monitors had to be procured chiefly in Columbia County, in the interior of the State of Pennsylvania.

"There was also difficulty in securing timber for the

curved futtocks, which were principally made of roots and were obtained from Delaware.

"The frames were fitted together solidly and caulked before ceiling or planking was secured, and the outside planking below the lower edge of armor was twelve inches thick, tapering off to the lower turn of the bilge to five inches. So the ship in her defensive capabilities was a war machine of no mean type.

"If the ship had been built of steel instead of wood, she would have been sunk when she was struck by a spar torpedo off Charleston.

"The explosion took place at the height of the orlop-deck, where the outside planking was twelve inches thick, and where the end of a sixteen-inch beam backed the frames. The side sprung in about six inches at the point of contact with the torpedo, 'brooming' the end of the sixteen-inch oak beam, and considerable water came in for a short time. The side of the ship, through the elasticity of the material, came back to its original form in a short time and the leak stopped. A gigantic marine, who was sitting on his chest at that part of the deck near the point of the explosion was thrown upward against the beams above him, breaking his collar-bone, and he was the only person injured on the ship.

"The time involved in the construction of the 'New Ironsides,' launching in six months from the laying of the keel, was remarkable in view of the fact that, besides the timber difficulty, nearly all the skilled workmen and shipwrights here had gone into the navy-yard, and we were compelled to scour the country for men who were mostly indifferent mechanics. A large number of ship-carpenters and other men came from Baltimore and Maine, who had left their homes to avoid conscription or to secure the high rates of wages paid here.

"An interesting incident connected with the building of the 'New Ironsides' was the fact that during the first half of her construction the progress in naval ordnance had advanced so rapidly that the authorities concluded to enlarge the caliber of her guns sufficiently to double the power of the original design. The ship was at first planned to carry sixteen 8-inch smooth-bore guns, which was at that time considered the heaviest caliber that could be worked in a broadside mount. Having in view the fact that all war-ships heretofore built, particularly steam-ships, exceeded their calculated draught, I determined to avoid a similar error in this ship. I provided against it in my calculations of displacement by allowing a foot for a margin. The draught was not to exceed fifteen feet; I allowed for fourteen feet. The minimum height of the port-sills above water at load draught, to insure sea-worthiness and ability to fight the guns in sea-way, should have been seven feet, according to our instructions. But in getting up the plans I arranged that the port-sills with the 8-inch battery would be eight feet above water. My calculations having been correctly made, I had a foot to spare.

"About three months after we began work, and when the frames were up and the beams in, the Department decided to arm the ship with fourteen 11-inch Dahlgrens in broadside and two 200-pounders (8-inch Parrotts). They were all muzzle loaders. This, together with the increased weight of ammunition for the larger guns, exactly consumed my foot of margin and brought the port-sills down to the normal height of seven feet above water, and the draught of ship there was not over fifteen feet, the original design.

"It may not be improper to say that I received much credit and congratulation from the Board and others for

my foresight in allowing the margin as I did, and for the correctness of my calculations. But for that the modified battery would have brought the port-sills down to six feet or less, which would have rendered it dangerous to open the main-deck ports in much of a sea.

"During the earlier stages of the construction of this ship but little attention was paid to it by the people of the country; the exciting conditions of the war on land; battles won and lost; the movement of troops, etc., occupied the entire attention of the people; so that while the yard was left open and no fence around it there were no visitors.

"When the battle between the 'Monitor' and 'Merrimac' took place a short time before launching the 'New Ironsides,' the whole world was aroused, and their attention was called to the fact that there were such things as armor-clad ships.

"When the number of visitors who applied for admission was so great that we had to build a high fence around the shipyard, and only admitted those who secured tickets issued by us, and when the launch took place, it was under conditions of great excitement and enthusiasm. The completion of the ship was accomplished in a very short time, and her first scene of operations was before Fort Sumter, which she bombarded eleven months and two days after the contract was signed.

"At this point the history of the contracts may be stated:

"When the appropriation was made by Congress for the purpose of constructing iron-clads, the Secretary of the Navy, as has been remarked, created a board on armored ships, consisting of Commodores Paulding, Smith, and Davis, who were fully authorized to carry out the provisions of the law and make contracts, keeping

in view what had been done by England and France in the way of iron-plated floating batteries. These gentlemen advertised for plans and specifications accompanied by proposals for accomplishing the purpose of the act of Congress. There were twenty-five or thirty proposals, embracing a great diversity of projects, the principal features of most of which were lack of well-defined plan, type, and character.

"After considerable investigation, the board decided to accept three plans and award the contracts. They were the 'New Ironsides,' the original 'Monitor,' and the 'Galena.' Those three vessels exhibited a vast diversity in form, construction, and outfit.

"A number of fables have originated and have come to be believed as truths about many of the circumstances attending the selection of plans. Among others, it was said that Mr. Lincoln himself, being impressed with the claims of Mr. Ericsson, had to interfere, and ordered the board to select the 'Monitor.' This is entirely false, for no such demonstration was ever made by Mr. Lincoln, and the board was not influenced at all by any considerations of that or any other kind except their own judgment.

"The contract for the 'New Ironsides' was awarded to Merrick & Sons; the design, plans, and specifications of hull complete had been made by me in connection with Mr. B. H. Bartol, who conceived the project and had charge of the proposal to the government,—Mr. B. H. Bartol was Superintendent of Merrick & Sons at that time. When the contract was awarded to Merrick & Sons, they sub-let the hull together with the fittings to our firm, in accordance with a previous agreement with Mr. Bartol. The contract price was about $848,000. Merrick & Sons furnished the engines and armor plate.

The engines were designed by I. Vaughan Merrick, and were duplicates of those which they had completed for a sloop-of-war, and were for a single screw. The speed was about seven knots. She was bark-rigged with bowsprit.

"After completing the 'New Ironsides,' I proposed to build two more of similar type with certain modifications and improvements, that is, sea-going iron-clads, with twin screws instead of a single one, and in increasing the speed and the efficiency of the armor. But at that time what was known as the 'Monitor craze' was in full blast, and, notwithstanding the excellent all-around performance of the 'New Ironsides,' she remained the only sea-going broadside iron-clad in the navy, and was the first to fire a gun at an enemy, and fought more battles than all other sea-going battleships past and present put together.

"The armor plate of the 'New Ironsides' was made partly at Pittsburg and partly at Bristol, Pennsylvania, and was of hammered scrap iron. It was four inches thick, and the plates, which could now be rolled in many mills and be considered light work, were then looked upon as marvels of heavy forging.

"When the contract was made for the ship, wages for shipwrights were $1.75 per day, and in less than two months they rose to $3 per day. We contracted for all the copper sheathing and bolts the day after signing the contract at twenty-nine cents per pound; in four months it was sixty cents per pound. Materials in general went up from 50 to 100 per cent. before we finished the ship.

"Great and radical changes have since occurred, but, primitive as the 'New Ironsides' seems in comparison with modern battleships, it is doubtful if any one now existing will ever see as much fighting or make so much history as she did. Last July, in an address read before the Naval War College at Newport, I said:

"'I cannot better illustrate my point than by comparing the first and the last sea-going battleships built and delivered to the government by Cramp. The first was the 'New Ironsides,' built in 1862. The last is the 'Iowa,' completed in 1897. Each represented or represents the maximum development of its day.

"'The 'New Ironsides' had one machine, her main engine, involving two steam-cylinders. The 'Iowa' has seventy-one machines, involving one hundred and thirty-seven steam-cylinders.

"'The guns of the 'New Ironsides' were worked, the ammunition hoisted, the ship steered, the engine started and reversed, her boats handled, in short, all functions of fighting and manœuvring, by hand. The ship was lighted by oil lamps and ventilated, when at all, by natural air currents. Though, as I said, the most advanced type of her day, she differed from her greater battleship predecessor, the old three-decker 'Pennsylania,' only in four inches of iron side armor and auxiliary steam propulsion. She carried fewer guns on fewer decks than the "Pennsylvania," but her battery was nevertheless of much greater ballistic power.

"'In the 'Iowa' it may almost be said that nothing is done by hand except the opening and closing of throttles and pressing of electric buttons. Her guns are loaded, trained, and fired, her ammunition hoisted, her turrets turned, her torpedoes, mechanisms in themselves, are tubed and ejected, the ship steered, her boats hoisted out and in, and the interior lighted and ventilated, the great search-light operated, and even orders transmitted from bridge or conning-tower to all parts by mechanical appliances.

"'Surely no more striking view than this of the development of thirty-five years could be afforded.'

"The battery of the 'New Ironsides' was mounted in broadside, and she had eight ports of a side, out of which she fought seven 11-inch Dahlgrens and one 200-pounder Parrott, the maximum train or arc of fire being about 45 degrees.

"The 'Iowa's' four 12-inch guns are mounted in pairs in two turrets, and train through arcs of about 260 degrees forward and aft respectively. Her eight 8-inch guns are mounted in pairs in four turrets, and each pair trains through an effective arc of about 180 degrees.

"The 'New Ironsides' had no direct bow or stern fire.

"The 'Iowa' fires two 12-inch and four 8-inch guns straight ahead and straight astern.

"The maximum shell-range of the heaviest guns of the 'Ironsides' was about a mile and a quarter, that of the 'Iowa's' heaviest guns is about eight miles. The muzzle energy of the 'Ironsides'' 11-inch smooth bores was to that of the 'Iowa's' 12-inch rifles about as 1 to 26.

"The fate of the 'New Ironsides' is well known: she was destroyed by fire at League Island in 1866, about a year after her last action."

Judged by modern standards of construction, the time expended in building the "New Ironsides" was marvellously brief, six months, because, as Mr. Cramp said, she was in action against Fort Sumter within eleven months from signing of the contract.

Of course, there can be no comparison between the methods of her construction or the nature of her appliances and those of a modern battleship, yet in her time and for her day she

was the most formidable and powerful sea-going battleship afloat.

Mr. Cramp, notwithstanding that he was entering upon a new and untried field without any prior guidance of observation or experience, undertook the design and construction of this remarkable vessel with all the confidence that a sense of professional mastery never fails to inspire; and so confident was he that the "New Ironsides" would prove a success that, while she was building, he proceeded to design two other vessels of the same type, but embodying numerous improvements which his experience in construction of the "Ironsides" from day to day suggested to him, and when these designs were completed he offered them to the Department.

He then discovered that the Navy Department had become entirely under the influence of what might be called the "Monitor craze," which absolutely dominated the councils of the Department and of Congress in respect to armor-clad vesels.

A combination, or "ring," was formed, with head-quarters in New York, to prevent the construction of any type of iron-clad vessel except monitors, and it had sufficient power to carry its determination into effect.

A sudden halt was made in the development

CRUISER NEWARK

of the armored sea-going type which originated during the Crimean War. France had finished the construction of "La Courunne," "La Gloire," and several others, one of which had made a voyage to Vera Cruz before our Civil War, and certain lessons derived from that ship during the voyage were utilized in the construction of the "New Ironsides." Both England and France were proceeding slowly in the development of the very complete type of battleship of the present day. While they built several vessels of an improved monitor type and adopted the turret on a roller base, in many cases they adhered to the course first laid out. The late British battleships have fixed barbettes and shields for their heavy guns.

The old Timby turret is practically a revolving barbette extending above the guns, which had to be loaded at the muzzle and the rammer being jointed, eleven minutes being occupied in loading and firing.

In the operations before Charleston, the Confederates would leave their bomb proofs after a shot was fired, and prepare for the next one during the eleven minutes and retire unharmed, ready to renew the contest. Under these conditions, the defence became a system

of guns in a casemate connecting with a bomb proof.

The old-fashioned monitor, viewed simply as a floating battery for use in smooth water, was serviceable. It was not in any sense a sea-going vessel, and it was always in danger of foundering as it crept along the coast from harbor to harbor. Besides this, it was almost intolerable to its officers and men in the living sense. In fact, service in the monitors developed a new and distinct disease known in the war-time pathology as the "monitor fever." Whenever one was torpedoed, as for example the "Tecumseh" in Mobile Bay, she sank immediately; so quickly, in fact, that her crew below deck were unable to escape. The torpedo which the "New Ironsides" resisted practically without injury would have instantly sunk any monitor then existing. The "Ironsides," on the contrary, was a sea-going vessel of the best and stanchest type, capable of any length of voyage with comfort and perfect safety to her officers and crew.

A wise administration of the Navy Department, or one not affected by the influence of cranks and combinations, would have built at least half a dozen vessels of that type as soon as they could be constructed.

Mr. Cramp, realizing and appreciating the

value of the type, and knowing that the influences which prevented its multiplication in the navy were unworthy, keenly felt the sting of his repulses. However, he proceeded to build such ships as the Department required, including a monitor, and from that time to the end of the war gave the navy the full benefit of his experience and skill in all directions, both in new construction and repair.

Partly through the natural unthinking enthusiasm of the people in times of great excitement and partly through a carefully planned campaign of sentiment adroitly managed by the ring, the monitor became almost the symbol of patriotism.

After the repulse of the "Merrimac" in Hampton Roads, Ericsson was almost deified, particularly by that class of people who consider rant synonymous with eloquence. Yet such sentiments were actually cherished at the time by a great many people who knew nothing whatever about the actual merits of different types of vessels. But their fanaticism made the operations of the monitor ring easy, and at the same time made it impossible to introduce or carry forward any other type of armored vessel during the whole Civil War, no matter how efficient or how desirable it might be.

Captain Ericsson is popularly credited, and doubtless will be in history, with the complete invention of the monitor. So far as the form and structure of the hull, which was simply "scow bottom," and the fantastic type of its propelling engine and the Ericsson screw were concerned, this is probably true, at least so far as known; but the main distinguishing feature of the monitor was not its model of hull nor its propelling engine, but its revolving turret; and this device had been invented and patented by Mr. John R. R. Timby several years before the outbreak of the Civil War. Timby had proposed to use the revolving turret system for sea-coast defence, as a primary proposition. However, in his description, upon which his letters-patent were issued, he suggested that it might also be applied to floating structures or batteries. All that Ericsson did in the application of the turret system to his monitor was to appropriate Timby's invention and act upon his suggestion; a fact which was abundantly demonstrated afterward when Mr. Timby received compensation for the infringement.

But all these facts probably went for little or nothing. It seemed that the people had determined to make a demigod of Ericsson,

and there was no gainsaying them. They would have it so, and so it is.

Mr. Cramp, in a hitherto unpublished paper, deals with the history and operations of the monitor ring with regard to its *personnel* and the details of its origin and methods, the origin of the "fast cruisers of the navy," and the "state of marine engineering of this country as it existed at that time." In this paper, as will be seen, he hews to the line.

THE "MONITOR."

"The coming out of the 'Merrimac' for the last time, and her successful repulse by the 'Monitor' having driven her back into Norfolk, gave a boom to the monitor system, the extent of which had never been witnessed in this country before.

"The enthusiasm that always greets successful combats in war-time was on this occasion of an extraordinary character, and the whole country was aroused to the highest pitch of excitement.

"The designer of the ship, John Ericsson, already well known as one of the principal promoters and successful advocates of screw propulsion, and Alban C. Stimers, who was engineer during the fight, and some of the officers, were the recipients of the most extravagant and hysterical demonstrations in the way of hero worship.

"An illustration of the effect that this battle had on the popular mind at that time may be found in an address of Bishop Simpson at the Academy of Music in Philadelphia.

"During the war, frequent addresses were made

throughout the country by well-known orators, statesmen, and ministers of the gospel, intended to promote a patriotic spirit and encourage the doubtful.

"I was present at the Academy of Music shortly after the 'Monitor' had been made famous by repulsing the 'Merrimac,' when, in referring to Mr. Ericsson, the Bishop stated that 'the Almighty had directly interposed in the contest between Captain Ericsson and Robert Stephenson in England,' both of whom had responded to the offer of the Liverpool and Manchester Railway Company of a premium of £500 sterling for the most improved locomotive engine. This was at the very beginning of the introduction of railways in Great Britain, and the following engines entered for the prize:

"The 'Novelty,' by Ericsson and Braithwait; the 'Rocket,' by Robert Stephenson; the 'Sans Pareil,' by Timothy Hackworth, the 'Perseverance,' by Mr. Burstall.

"Mr. Joseph Harrison states in his book, the 'Locomotive Engine,' that 'the prize was easily won by the "Rocket," built by George and Robert Stephenson, having fulfilled, in some respects, more than all of the requirements of the trial.'

"Bishop Simpson, in referring to this incident, said that 'the Almighty had interposed to prevent Captain Ericsson from succeeding there, so that he might become disgusted with England and shake the dust of that country from his feet and depart for America, in order that he might be here ready to save the country.'

"In using the words 'in saving the country,' Bishop Simpson looked on the fight between the 'Monitor' and the 'Merrimac' as a great many other people did; that is to say, if the 'Merrimac' had escaped, she would have bombarded Philadelphia and New York and other cities of the North, thereby compelling the government to sub-

mit to the South. But the 'Monitor' having destroyed her before she got out, John Ericsson was therefore entitled to all the credit due to a person who had been specially delegated by the Almighty for saving the country. John Ericsson had already become famous on account of conspicuous efforts in promoting screw propulsion in the United States generally, and particularly with reference to the use in warship construction. In view of his unceasing labors in this direction his name had become inseparably associated with the screw propeller. This added much to the enthusiasm that prevailed at that time, and all minor considerations being overlooked. It was discovered a very short time after the war was ended that, even if the 'Merrimac' could have escaped at that time from her encounters with the 'Cumberland,' 'Congress,' and 'Monitor,' it would have been impossible for her to go as far north as Philadelphia or New York. It was found that she was in a very badly crippled state as a result of her ramming the 'Cumberland' and 'Congress;' and the statement was made by those who temporarily repaired her in Norfolk that her bow was split to a great distance below the water.

"To use the words of one of the workmen, he had 'put more than a bale of oakum in the opening.'

"The construction of the 'New Ironsides,' 'Monitor,' and 'Galena' had already been practically taken out of the hands of the Construction Department of the Navy by the Secretary of the Navy, who became a convert to the monitor craze after the battle with the 'Merrimac.' The 'Monitor' had become the ideal type of armored warship, and a sort of sub-department of the navy was created and located at New York for the sole purpose of building and fitting out monitors.

"This establishment in New York was placed under the

immediate supervision of Admiral Gregory, the active head being Chief Engineer A. G. Stimers, who had been the chief engineer of the 'Monitor' during her engagement with the 'Merrimac.' He had associated with him Isaac Newton and Theodore Allen, the nephew of Mr. Allen of the Novelty Works in New York. This board was in direct communication with the Secretary of the Navy.

"The monitor party, which may be described as the executive of the ring or the New York section of the Navy Department, soon assumed a position of great power and responsibility; the balance of the Department amounting to practically mere nothing in the way of new construction.

"Mr. Stimers and Mr. Allen were autocrats. They spent money lavishly, ordered vessels, designed them, made contracts, sub-contracts, made purchases, and carried everything with a high hand.

"Mr. Lenthall, the Chief Constructor of the Navy, and Mr. Isherwood, who was on his staff as engineer, were entirely set aside, and practically disappeared from the scene as far as new constructions were concerned.

"A large number of monitors were built, slightly improved in structural detail over the original, and were engaged as soon as finished in the operations before Charleston.

"The head-quarters in New York was often called the 'draughtsmen's paradise,' on account of the great number of draughtsmen employed there, and who were getting twenty dollars a day. The most extraordinary displays of drawings were issued to the various machine-shops which were building monitors at that time. They were particularly noticeable on account of the extravagant character of the shading of the circular form of the turrets, smoke-stacks, conning-towers, etc.

"The inspectors of construction that were employed by the New York party emulated their superiors in carrying things with a high hand at the various concerns where they inspected the vessels.

"Up to that time our concern had not built any monitors. We were not in what was called the 'Monitor Ring,' not having indorsed the type nor manner of construction, besides being the authors of the 'New Ironsides' type, which the ring had determined to suppress.

"Immediately after the 'New Ironsides' had been engaged in a small way in the first fight at Charleston, we recommended that the government should build other vessels like her, but with twin screws and with other improvements.

"By request of Assistant Secretary Fox, we prepared plans of the proposed ships, some all iron, and others of iron and wood in the construction of the hull; but the Department in Washington refused to listen to or recommend anything. The New York section continued to be paramount, and we were ruled out of naval construction for a time.

LIGHT-DRAUGHT MONITORS.

"The next development of the craze was that of the so-called 'Light-draught Monitors.' These were intended to operate in Albemarle and Pamlico Sounds and various other shallow waters in the South. Twenty of them were authorized, and we responded to the advertisement of them by bidding for one or more.

"It was found that, with the exception of Harlan & Hollingsworth, we were the lowest bidders. We were a little higher than Harlan & Hollingsworth, but the time in which we offered to build them was shorter than theirs.

"The government promptly gave us one and the Harlan

yard one, and notified eighteen other bidders that they could have one each at the same price as ours, which amounted, as near as I can remember, to $350,000.

"Some of the bids ran as high as $750,000, and these bidders had some delicacy in accepting prices at one-half, because, to accept the contract at one-half, it would be an acknowledgment that they did not know what they were about, or that they were trying to rob the government.

"The fact is, that none of the bidders except Harlan & Hollingsworth and ourselves were ship-builders. They were in other lines of mechanical construction, and of course they did not have the slightest idea of what was to be done or what it would cost.

"The drawings on which the vessels were to be built were of the crudest character; only a midship section and one or two vague longitudinal sketches being furnished as a guide or basis of construction.

"Notwithstanding, as I said before, we were the lowest bidder, thereby saving millions of dollars to the government, only one was awarded to us. The balance was offered to the other bidders at our price, and the offer was accepted by most of them.

"Having received our contract, we promptly visited New York to get the details of construction and engines in order to begin work and procure materials. The demand for materials was greater than the supply, and all were in a feverish state of excitement. To get our orders out quickly, I immediately made application to Mr. Stimers for plans, and had a long and detailed conversation with him and Theodore Allen over what plans they had developed, and numerous alterations were made to the plans as drawn.

"Their first plan permitted the boilers to come within three and one-half inches of the bottom plating of the

ship, practically landing the boilers on the three and one-half inch angle-bars, which had at that time no floors.

"I suggested in a rather strong way that this would not do, and after considerable discussion they concluded to make the vessels a little deeper, give the deck more spring, and put shallow floors in. Other important alterations were made as the work progressed.

"We would have had our vessel overboard first, but the northward march of General Lee previous to the battle of Antietem interfered with the furnishing of materials, and also with our own working force in the shipyard.

"Our employees, with those of the rolling-mills supplying materials near Philadelphia, organized themselves into military companies for the purpose of defence. Two companies were formed in our establishment.

"While these delays affected us, they did not interfere with the progress of the monitor which was building in Boston; but when this vessel was launched, she sank to the bottom from lack of buoyancy, and a halt was called on the nineteen other vessels.

"These vessels had been constructed on very vague plans and conditions. Mistakes were made in the original design, and weights added without investigating the correctness of the original sketch, which, with the so-called 'calculations,' were furnished by Mr. Ericsson; at least they had been examined, approved, and signed by him. They were not furnished to bidders.

"The day after this launch, the 'Monitor Ring' was in a state of collapse! Mr. Lenthall and Mr. Isherwood now reasserted their proper authority. They ordered Mr. Stimers and Mr. Allen to reduce the weights in the turrets, and wherever else it was possible to do so sufficiently to make the vessels float.

"These reductions in equipment, outfit, etc., were com-

municated to the builders at Chester, before they launched the 'Tunxis'; but these vessels, by the reductions, were rendered entirely useless for their designed service, or any other.

"Finding that the Boston vessel and the 'Tunxis,' built at Chester, notwithstanding the alterations, lacked efficiency to a serious degree, they decided to rebuild most of the others by deepening them, and the whole matter was placed in my hands by Chief Engineer King, who with some others were designated by the Secretary of the Navy to investigate and prepare plans for the deepening, and to ascertain the cost of the alterations.

'After a careful investigation, I found it would be necessary to increase the depth of the hulls about thirty-three inches, involving the necessity of raising the solid oak decks to that extent with the hull proper, and the armor backing and armor which had to be taken off and replaced.

"A so-called expert was detailed to assist me in my calculations, but, having no use for him, I did not avail myself of his services.

"When I sent my plans and our price for the deepening of the vessel to the Secretary, he immediately awarded us the contract for deepening ours (the 'Yazoo'), and accepted our price, and notified the eighteen other people that he would give them the same price for deepening theirs. The other contractors would not accept my price, and they denounced me for not having put a 'higher price on the job,' when I had the opportunity to do so. I told them that I had estimated that we would make 30 per cent. profit, and I contended that that was enough, notwithstanding we were under the influence of war prices, and that I had been delegated to do what I considered was

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CRUISERS PENNSYLVANIA AND COLORADO

right. In other words, I held that the Secretary had placed me upon honor.

"These eighteen other builders ultimately got higher prices than we did. They made all sorts of claims to the government through their representatives, and made life a burden to the Secretary by showing, or endeavoring to show, him that wages were higher everywhere else in the localities where these vessels were built than they were in Philadelphia.

"In fact, every one of the other builders ultimately received higher prices than we did, and later on some were awarded additional sums by act of Congress, notwithstanding that the drawings, specifications, plans, and designs for the alterations were made by me without pay! without even thanks!

"Subsequently the Department decided not to alter all alike, and about one-half of them were finished without the turrets, and the big guns were taken out, thereby relieving their builders of the necessity of making them deeper. The decks were finished, and they were designated as a sort of torpedo boat for harbor defence. These vessels, as altered according to my recommendations, would have been efficient factors in the operations in the southern waters if the war had not ended before they were finished.

"The 'Sub-Department' in New York, with all its investitures and appointments, was abandoned, and the Navy Department took up the monitor matter from that time onward. But the mischief had been done. The service had been debauched and the Treasury robbed of millions, which an intelligent policy from the start might have saved.

"During the alterations on the 'Yazoo,' the Chester light-draught monitor was sent to our place to be altered.

Notwithstanding she had been finished with the reduced weights recommended by Mr. Stimers, she still continued defective, and was sent to our yard to be altered according to my new plan.

"As it was necessary to raise the turret in order to raise the deck, and as we were compelled to haul the vessel out of the water, we took the guns out of the turret and proceeded to remove it also. Hoisting out the guns was an easy accomplishment, but the removal of the turret was a difficult problem.

"At first sight, cutting out the rivets and bolts, taking apart and rebuilding it, appeared the most feasible. This, however, was an expensive transaction. After careful investigation, we concluded that it could be hauled off the ship on to the dock on sliding-ways if the work was done with the greatest rapidity with the best men at it. The removal of guns and turret to the dock was successfully accomplished.

"On account of the great cost due to occupying a dry-dock long enough to make the change, it was determined to haul her out on sliding-ways, reversing the process of launching, and that without using a coffer-dam for laying the ground-ways.

"The vessel was hauled out by the use of six 12-inch falls, two of which were attached to end of upper ways, two to a chain that passed around the stern extending to amidships, the ends lashed to the ship just above high-water mark, and the other two to holes in the bow made for the purpose.

"When the six large 'crabs' were started with all of the men that could be put on them, they never stopped until the vessel was entirely out of the water, taking a day and a night for the operation.

"This was by all odds the heaviest vessel ever hauled

out on ways in this country, and, in view of the simplicity of its preparations and the limited cost, was one of the great achievements of the time occupied by the Civil War. But little or no notice was taken of it by the papers, as battles lost and won were the sensation of the day.

"While the craze for constructing monitors had possession of the country, the government built nothing else in the way of armored vessels.

"Mr. Lenthall and Mr. Isherwood, who was on Mr. Lenthall's staff at that time, had no power to antagonize the monitor craze successfully, and a large one of wood was ordered to be built in each navy-yard, to be designed by the constructor of that particular yard as far as the hulls were concerned. But little money of the vast expenditures of the navy during the war was devoted to other iron-clad constructions than that of the monitor class.

"The 'Miantonomah,' which was one of these vessels built in one of the navy-yards and designed by the constructor at the navy-yard in which she was built, was sent to Russia under command of Commodore John Rodgers with Assistant Secretary Fox, as Special Envoy to convey to the Emperor certain congratulations. The idea was that the government of Russia would construct a number of large monitors. The trip, so far as that was concerned, was a failure. Commodore Rodgers, who went in command, was formerly in command of one of the original monitors which had been engaged in the contests before Charleston, and also in the Savannah sounds in the Civil War, and he was one of the strongest of the captains in favor of that type. As a rule, the captains and other officers were all adverse to them.

"While the Navy Department and Naval Committee of

Congress were favorable to the monitor type, Messrs. Lenthall and Isherwood were against it; but they were very backward in doing or in recommending anything else, and permitted themselves to be overlooked. In view of this negligence on their part, it was argued that it was better to try to do something, even if it turned out wrong, than to do nothing at all.

ORIGIN OF FAST CRUISERS.

"On account of the heavy loss of our ships captured by the Confederate cruisers, and our failures to capture any of them with the exception of the 'Alabama,' which was accidentally discovered and destroyed by the 'Kearsarge,' our Navy Department conceived it necessary to have constructed a number of very fast cruisers, faster than any known afloat.

"The Department delegated Messrs. Stimers and Allen, when in the height of their power in their 'Sub-Department' in New York, to design and have them constructed.

"Not being naval architects, and not having any naval architect of competent knowledge in connection with their 'Sub-Department,' but having an exalted idea of their own abilities not only as naval architects and engineers, and everything else in that direction, they designed some ships of a peculiarly fantastic model, and engines of equally fanciful character which they called, for short, the 'grasshopper engine.'

"Having the power to design these vessels and contract for them, they invited me to inspect the plans and build two of them.

"On looking over these designs, I began to criticise them, and recommended modifications.

"I was wound up suddenly by the observation that, as they intended to give us two ships and give us what they

considered a fair price for them, we must build them exactly as they were designed.

"As the price they offered was high, and feeling that we would practically have our own way with them, provided we adhered to the general type of design, and having no responsibility, we thought that we had better take them and make a handsome sum out of them than to stand out on trifles and fight for glory alone.

"I had commenced at the beginning of the war with criticising the monitors, and our concern got nothing, and the grass might have been growing in our yard if we adhered to that course. So the price was fixed for these ships, and we were about going on, when the fatal contretemps of the launching of the Boston light-draught monitor occurred. The 'fast cruiser' contracts of Stimers and Allen were set aside, and a large sum of money saved to the government. The ring was broken. They who had had unlimited power heretofore suddenly found themselves without the power to contract for a dingy.

"This was really a great disappointment to us and several other contractors, because the price they fixed for the cruisers was liberal, and, as they would not listen to suggestions, they were naturally expected to take the responsibility.

"After the matter of the fast cruisers was taken out of the hands of the 'Sub-Department of the navy' after the sinking of the Boston monitor, the Navy Department ordered each of the four navy-yards to design one on a scheme of general dimensions, and giving the engines out by contract to the various engine-builders, the engines, with two exceptions, being designed by Mr. Isherwood. The machinery for the 'Madawaska' was designed by Ericsson!

"At the same time, to encourage private enterprise,

one was given to us, hull and machinery of our own design. We awarded the engines to Merrick & Sons, who built them on their own designs. All of these vessels were constructed of wood. Our ship was called the 'Chattanooga,' and that built at the Philadelphia Navy-Yard was called the 'Neshaminy.'

"The engines designed by Mr. Isherwood were geared, the propellers making two and one-half revolutions to the engine's one. When these engines were designed, gearing was supposed to be an indispensable necessity in screw-engine practice.

"The engines designed for the 'Madawaska' by Ericsson were of the same design as that of the 'Dictator,' and would be considered of fantastic character at the present time; that, however, might be said of most marine engines of that period.

"Much was expected of the 'Madawaska's' engines by Mr. Ericsson's friends, but after a trial of twenty minutes it was stopped, as the crank-pin and main-bearing brasses ran out into the crank-pit before they had attained their required performance.

"The engines were subsequently taken out and compound engines of poor design were put in by parties who had never built a compound engine before. The performance of these engines was but little better than that of the original.

"Having been eminently successful in the introduction of compound engines in this country, by the construction of four compound engines for the American Line and one set for the 'George W. Clyde' of our own design, we made application to the government to substitute the design of compound engines in place of the first set of 'Madawaska,' but our offer was not accepted, unfortunately for the government.

"All of these vessels were of good model, and all built according to the latest improvements of the great ship-builders and contractors, and the devices in the way of rigging, spars, and other outfit, besides the model and general arrangements were from the stand-point and designs of the naval constructor and ship-builder at the yard where they were built. No ships in modern times have been superior to them in design, construction, and ship-building technique. The engines, however, were not up to the standard, and, no matter what else may be said of them, they were much too small.

"Some time after these vessels were laid up, an effort was made by private parties in New York to utilize them in a trans-Atlantic line to carry the mail, and a proposition was made to the government covering certain conditions under which they could be operated. The proposition meeting a favorable consideration, an exhaustive examination of the engines was made by Mr. Norman Wheeler, of New York. He found that the gearing of the driving-wheels and pinion had been worn down five-eighths of an inch during their trials; the project was abandoned, and the ships gradually disappeared.

"It has been stated that the 'Wampanoag' made her designed speed from New York to Charleston in one trial.

"The British government was very much interested in this scheme of building fast cruisers for our navy. Captain Bye-the-sea, who was Naval Attaché of Great Britain, was ordered to investigate the matter here. He decided to obtain the plans and drawings of the 'Chattanooga,' and applied to the Secretary of the Navy for his approval. The Secretary sent a letter to us stating that, so far as he was concerned, he had no objection. So we furnished Captain Bye-the-sea with the drawings of the 'Chattanooga' in return for some valuable information that he

had, which we expected to utilize in some construction of our Navy Department. We did not, however, realize anything in that direction.

"The 'Inconstant,' built by the British government, was practically the same model as that of the 'Chattanooga,' but with another deck added to her, which gave her an entirely different appearance, and which made her look a good deal heavier above the water than the 'Chattanooga' did, particularly as far as the stern was concerned.

"The 'Wampanoag,' one of the ships built at one of the navy-yards, made what was designated as one quick trip from New York to Charleston; but in doing so the teeth of the gearing were worn to the extent of five-eighths of an inch, practically ruining her usefulness for any future service. The vessel was laid up and never sent to sea again.

"The 'Chattanooga' did not make a successful trial. The engines were too small, and a long contest between the engine-builders and Mr. Isherwood occurred over the construction of the machinery, ending in the engine-builders making modifications, and the vessel was laid up.

"As these ships were considered at that time too expensive to equip for sea service in time of peace, they were laid up; being wooden and very much neglected, they rotted at their wharves.

"The failure of these vessels to demonstrate the propriety of building fast cruisers was due altogether to defective machinery and to defective marine engineering as it generally existed at that date in this country, and to the material of their construction being of wood.

EVOLUTION OF MODERN MARINE ENGINE.

"At that time a large majority of the marine engineers of the United States were adherents of the paddle-wheel,

walking-beam type of engine, and nothing would do but that type of engine. That was particularly the case in the city of New York.

"Philadelphia, at a very early period in the history of steam propulsion, advocated the propeller engine, and as far as the working of propeller engine was concerned, the degree of workmanship and skill in its design attained there was never excelled in Europe or America. These engines were generally small in power, and the prejudices of the people were against them, particularly as all New York ship-builders and marine engineers spoke of propeller engines with the most profound contempt.

"Now and then some one in New York would build a propeller engine of poor design which would prove disastrous, so in large enterprises the walking-beam, side-wheel type of engine prevailed and was the fashion.

"This was done to such a great extent that when the first line of steamships was established between Philadelphia and Charleston, side-wheel engines were put in them by parties who had a great deal of interest with the management of the steamship company.

"In fact, it was this craze for the walking-beam engine and side-wheels in New York which ruined us as a steamship building country, and was one of the many causes for the supremacy in ocean commerce that Great Britain ultimately attained.

"After the government had stopped the subsidy, the Collins Line, which was run at an enormous expense, was withdrawn. We were completely out of the business. The influence of Philadelphia, as we had no large ships or large steamship companies, was not listened to.

"Rather than adopt the propeller and go to Philadelphia to have the engines built, steamship owners in New York permitted the whole steamship business, together

with all the foreign trade, to go to foreign countries. The British began early to establish large machine shops and to perfect the propeller engine. Though slow, they were sure.

"There was not a time in the history of steam navigation that we did not feel that we could equal or even excel the English builders of propeller steamships that were coming to this country. But, as I said before, we could not induce the New York merchants to embark in the enterprise.

"I am sure that if we had abandoned the side-wheel and commenced with the propeller at the time the British did and continued with steadfastness, we never would have lost it.

"The ships of this country were right, of the best form and model, and they were in advance of anything in Great Britain, as far as hull construction and design were concerned; but, while the ship-builders in New York were among the greatest in the world, the builders of marine engines there were the poorest in the world.

"When it was discovered that the propeller steamship was in every respect the best and had come to stay, it was too late to try to recover our trade.

"The construction of monitors and machinery during the latter end of the war was very demoralizing, and had its effect upon naval constructions long after the war was over.

"The Construction Department, which had not shown much enterprise during the war, had become very much deteriorated, and the system was inaugurated, principally by Mr. Isherwood, which exists at the present day, of dividing the executive department into many bureaus; and, to strengthen their heads and give them power, it was also provided that the appointment of these heads

of bureaus should be made by the President and confirmed by the Senate, thus making the Senate a coördinate factor in their existence, and the heads of bureaus independent of the Secretary of the Navy.

"This was started, as I said before, by Mr. Isherwood, who was on Mr. Lenthall's staff. He organized the Bureau of Steam Engineering as an independent bureau, not subordinate to the Secretary, and having its head appointed by the President and confirmed by the Senate. Of course he was made its Engineer-in-Chief."

That being started, other bureaus as they practically exist at present, the heads of which are independent of the Secretary, were established the same way. A great deal of friction occurred between the various branches of the Navy Department at that time, the effects of which continued for a good while. Nothing was built by the government, although the Secretary of the Navy had full power to do practically as he pleased with the appropriations. The appropriations in Congress at that time were made in bulk, and the Secretary could give vessels out by private contract or build them in the navy-yards.

Some few vessels involving antique ideas were started in the navy-yards and were principally of wood. The engines were contracted for by the various engine-builders of the United States. They were constructed practically on one general design.

On account of some irregularities and misunderstandings in the way of giving out contracts and certain favoritisms, together with the jealousies and bickerings of the various heads of the Departments and officers of the Navy, Congress became more and more exacting in their appropriations, until at last nothing was done in the Navy Department without a special appropriation for the particular purpose.

At the end of the Civil War in 1865, a large number of United States vessels under contract were uncompleted. In some cases, notably of the monitor type, work was immediately suspended upon them, and settlements were made after long and tedious delays. The Cramp concern, as already mentioned, had one vessel in hand under these conditions, the first-class fast cruiser "Chattanooga;" but the government provided for her completion, which was carried out, and her delivery concluded the relations of Mr. Cramp to the navy of the Civil War.

CRUISER COLUMBIA

CHAPTER III

Foreign Commerce in 1865—The "Clyde" and "George W. Clyde," and Introduction of Compound Engines —Commerce of 1870—Merchant Marine—Lynch Committee—Mr. Cramp and Committee—Lynch Bill—American Steamship Company—Visit to British Shipyards — John Elder — British Methods — Interchange of Methods—Merchant Marine continued—Dingley Bill — Defects — Act of 1891, Providing Registry for Foreign Ships—"St. Louis" and "St. Paul"—Extract from *Forum*—Remarks on Article—Committee of Ship-builders and Owners—New Bill Introduced by Frye and Dingley—North Atlantic Traffic Association—New Ship-yards—Tactics of North Atlantic Traffic Association—Our Navigation Laws, *North American Review*—Mr. Whitney—Unfriendly Legislation—Mr. Whitney's Letter—Effects of Letter—Mr. Cramp's Letter to Committee of Merchant Marine—International Mercantile Marine.

THE return of peace in 1865 found the country without sea-commerce either coastwise or foreign. Such ships as had not been taken up by the government had, with the exception of a few whaling-vessels in the Pacific Ocean, been transferred to foreign flags to save them from the ravages of Confederate pirates or cruisers which, to all intents and purposes, so far as construction, armament, equipment,

and crews were concerned, were nothing but British privateers in disguise. In the mean time England had taken every advantage of the situation, and by 1865 had practically absorbed all the magnificent ocean-carrying trade which the United States enjoyed prior to 1860. American ship-building was at a stand-still. The government at once threw upon the market all the ships which it had taken up for gun-boats, auxiliary cruisers, transports, etc., during the war. They were sold for anything that they would bring, and they were bought up as a speculation by new companies unfamiliar with the shipping business, and as a consequence they all failed. The ships were obsolete or worn out and soon passed out of existence. Certain coastwise lines continued to do a small business, but little or no attempt was made to restore our foreign trade; first, because none of the vessels which the government threw on the market were in a condition to undertake it; and, second, because, in consequence of the inflated prices of everything, any attempt to compete either in seafaring labor or material with England would have been absurd. Besides this, the whole energy and capital of the country were immediately directed to an extraordinary expansion of railway systems, so that the attention of the peo-

ple was entirely diverted from the sea and fixed upon the interior. For the next five or six years little or no ship-building of any description was done anywhere in the United States.

It was at this time that the Cramp Company considered it indispensable to attach engine building to the construction of hulls, as no satisfactory arrangement could be made to secure accurate performance that involved two independent and diverse handicrafts in the undertaking. They secured the services as engineer of Mr. J. Shields Wilson, whose training in the I. P. Morris Company, and at Neafie & Levy's works had demonstrated his fitness for the post, and as to whose methods they were familiar.

One of the first achievements of the new enterprise was the design and construction of the compound engines for the "George W. Clyde," finished in the spring of 1872, the first present accepted type of compound marine engines built in America. Immediately following them in 1873 and 1874 were the four ships for the American Line, the "Pennsylvania," "Ohio," "Indiana," and "Illinois."

The "George W. Clyde" was built for Thomas Clyde, who was the first ship-owner to introduce screw propulsion in ocean com-

merce in the United States by building the twin-screw steamship, the "John S. McKim," built in 1844, which he used in the trade of the Gulf of Mexico and as a transport when the war with Mexico occurred.

Having built the first screw steamship, the "John S. McKim," and the first steamship with compound engines, the "George W. Clyde," Mr. Clyde responded with alacrity to the recommendations of Mr. Cramp in favor of the use of the triple-expansion engines by building the "Cherokee."

The "Mascott" for Mr. Plant was built at the same time.

Mr. Clyde had formed the acquaintance of Mr. Ericsson soon after his arrival in this country in 1839, just before the "John S. McKim" was constructed, and became an early convert to his fascinations in exploiting the superior merits of screw propulsions over every other.

The "John S. McKim" and engines were designed by Mr. Ericsson, and built near Front and Brown Streets, Philadelphia.

Mr. Jacob Neafie, of Reaney, Neafie & Co., celebrated engine builders, who began business soon after by constructing propeller engines, had considerable practical experience in the construction of the "John S. McKim's" en-

gines before Reaney, Neafie & Co. had started business.

Mr. Ericsson had early secured the friendship of Commodore Stockton, and had a boat built for towing purposes by the celebrated ship-builders Lairds, of Berkenhead, called the "R. F. Stockton." Commodore Stockton had been already biased in favor of screw propulsion on account of the invention of the screw propeller as it practically exists to-day by John Stevens in 1803. Mr. Stevens was the head and front of the organization of the bay, river, and canal navigation between the two great cities of New York and Philadelphia, of which Commodore Stockton was a member.

The successful introduction of screw propulsion in the United States was certainly owing to the combined efforts of Stevens, Ericsson, and Clyde.

Mr. Clyde was always to the front where new improvements were to be made.

The Cramp Company, having taken the lead in these new departures in engine construction at the beginning, have continued to remain there. They have ceased to construct wooden vessels, sail or steam, since the construction of the " Clyde," of iron. This vessel was for Mr. Thomas Clyde, and preceded the " G. W. Clyde."

By 1870 the deplorable state of the American merchant marine attracted the attention of the Administration and Congress. The House of Representatives organized a select committee to investigate the causes of its decline, with instructions to submit in its report suggestion or recommendation of remedy. This is known in Congressional history as the "Lynch Committee," from its Chairman, the Honorable John R. Lynch, Member of Congress, of Maine. This committee surveyed the situation exhaustively, taking the statements of a large number of ship-owners and shipbuilders, and while there was considerable divergence of views as to the sum-total of causes, there was little or no diversity of opinion as to the most immediate and effective remedy.

This committee, after thorough investigation and mature deliberation, reported that, in view of the policy of foreign maritime nations, particularly Great Britain, in the way of subsidies and other methods of aiding and promoting their merchant marines, it would be impossible for American ship-owners to compete with them in the absence of similar expedients on the part of our own government. In other words, the Lynch Committee reported in effect that the primary requisite toward a resurrection of the American merchant marine

would be the adoption of a policy of subvention, or, as it is commonly termed, subsidy.

However, while the Lynch Committee was logical in its suggestion or recommendation of remedy, its investigations, so far as the sum-total of the causes of decline were concerned, and its estimate of those causes were incomplete and inconclusive, because it started out with the dogma that the then existing depression of the merchant marine was due wholly to the ravages of the war; and it did not take into account the correlative or co-operative facts of the situation, which were much broader and deeper in their application and effect than the mere suspension or destruction of our merchant marine by the war itself. In other words, the Lynch Committee failed to grasp or appreciate the fact that, while the war was wrecking our sea-going commerce, foreign maritime powers, and particularly the English, were making the most gigantic efforts not only to take the place of our ruined trade, but also to provide for a perpetuity of the substitution, so that at any time between the close of the war and the investigations of the Lynch Committee it had become impossible for an American ship-owner to operate a ship or a line of ships in any route of ocean traffic. By means of liberal subsidies under the guise of

mail pay, the British had in the interim covered every sea-road and appropriated every channel of ocean commerce. This fact the Lynch Committee seems to have ignored, although it was really the prime factor in the situation, as it stood in 1870. Mr. Cramp, in his statement before the Lynch Committee, went altogether out of the beaten path pursued by most of the other ship-builders or ship-owners who appeared. He said in effect that while the Civil War had been an immediate cause of the destruction of our merchant marine as it existed at the beginning of that struggle, still that was purely a physical cause, and in the absence of other causes need not operate after the war ended.

He called attention to the fact that the war had now been ended five years, but that the condition of our merchant marine, particularly in foreign trade, remained as pitiable as it had been in the height of the struggle. This he said argued the existence of other and more lasting causes than the simple destruction by war, whether by the government taking up our merchant-ships for its own use, or by the transfer of a great many of them to foreign flags to get the benefit of neutrality, or by the actual depredations of Anglo-Confederate privateers.

He explained that during our misfortune the English took every advantage in the way of appropriating to themselves and to their own ships the traffic which our ships had formerly carried; that when the war closed, they had absolute command of the ocean-carrying trade, our own as well as theirs.

He said that not only did the British government subsidize and otherwise aid their ships and ship-owners, but that they also brought to bear all the tremendous resources of their navy to help and encourage British ship-builders. Notwithstanding her enormous and well-equipped public dock-yards, the English government built a very large percentage of its hull construction in private shipyards, and not only that, but *all* their marine-engine work was let out by contract to private engine-builders, mainly independent establishments.

He stated that the result of this policy had been to develop the industry of marine engine building in Great Britain to a degree unknown anywhere else in the world.

On the contrary, our own government had done little for its navy since the war, and what little it had done had been carried out entirely in navy-yards.

This not only deprived private ship-building of the kind of aid and encouragement which

England lavished upon her private shipyards and engine-shops, but the navy-yards themselves were a constant menace to the good order and content of mechanics working in private shipyards.

Moreover, he said that the same class of mechanics who, immediately prior to the war, worked for $1.75 a day, now (1870) demanded and received $3.00 to $3.50 a day; whereas ship-building wages remained the same in England as in 1860.

He warned the committee that the day of wooden ships, particularly steamships, was past, and that the iron ship had come to stay, not only in England but everywhere else in the world.

He said that to enable the business of building iron ships and heavy marine machinery to become firmly established in this country, a very large amount of manufacturing machinery must be supplied, and in view of the present outlook no one would invest any considerable amount of capital in that direction without assurance of some aid and encouragement from the government similar to that which England rendered to her ship-building industry.

He then dwelt at considerable length upon the demoralization among mechanics produced

by the government's policy in confining its naval construction to the navy-yards.

He reviewed briefly the struggle between the Cunard and Collins Lines prior to 1858, and showed conclusively that the downfall of the American Collins Line was due to the persistent and constantly increasing subsidies lavished by the British government upon the Cunard Line, which our government in 1858 met by withdrawing the Collins subsidy and giving them instead the sea and inland postage on mail matter actually carried. In this respect he said Congress indirectly came to the aid of the Cunard Line and helped it to overthrow the Collins Line. He hoped that the committee would give these particular facts their earnest attention. He said that they did not require deep or intricate investigation, because they were matters of common notoriety, known to everybody who was at all conversant with the commercial history of the country.

The admission of material for building iron ships free of duty, he said, would be an advantage, of course, and many believed that if our ship-builders could be relieved from the tariff and get their material free they could compete successfully with foreign builders; but the difference in wages was too great to be entirely overcome by the mere admission

of materials duty free. As for materials, he would always prefer American iron for the construction of ships to foreign iron, provided it could be got at the same, or very nearly the same, price. There were many inconveniences, he said, attendant upon sending abroad for iron plates. He informed the committee that it was necessary to get the form of every plate and have it sketched before it was ordered, and if, after doing that, we must send abroad to have them made, very great inconvenience and delay would result.

This statement of Mr. Cramp before the Lynch Committee, of which the foregoing is only a synopsis, was really the key-note to all subsequent argument in favor of government aid to American ship-building and ship-owning. It presented the matter in a new light, or a light which was new in 1870.

It might be remarked here, in referring to his statement that "the form of every plate must be sketched before it is ordered, etc.," that Mr. Cramp himself was the originator of that system in this country, a system of ordering plates sheared to sizes at the mill. (See "American Marine," W. W. Bates.) Until he established this innovation, plates for building iron vessels had been rolled as nearly as possible to the sizes required and then sheared

ARMORED CRUISER BROOKLYN

and trimmed at the shipyard. This itself was a very remarkable and striking innovation, and was immediately taken up by all iron shipbuilders in the country, and is now the universal practice.

The legislative result of the first effort of Congress to take cognizance of the condition of the merchant marine was the bill introduced by Mr. Lynch, February 17, 1870.

Mr. Lynch's bill, although it may be described as the pioneer effort for the resurrection of the American merchant marine, proposed in concise form and plain, easily comprehensible terms, without any unnecessary verbiage or circumlocution, as practical and as sensible a system of subvention as has ever been put forward since. It was comprehensive in its scope, universal in its application, and liberal in its provisions. Later bills, more elaborately framed and more diffuse in their verbiage, have hardly improved upon the simple matter of fact form in which Mr. Lynch embodied his proposed policy.

This was the beginning of a Parliamentary war between American ship-owners on the one hand and the influence of foreign steamship companies on the other; a war which has at this writing lasted more than thirty years.

One subsidy was granted by Congress at this

early date, that of the Pacific Mail Steamship Company; but hardly had that subsidy begun to operate, when an exposure of certain methods by which it was procured brought about a great public scandal, which for the time-being put a peremptory end to the whole policy.

Whether the charge that the Pacific Mail subsidy was obtained by corrupt methods was true or not, the means in obtaining it were no more corrupt than those which have been employed by foreign steamship interests to defeat legislation in Congress favorable to American shipping from time to time ever since.

Notwithstanding these discouraging conditions, a group of Pennsylvania capitalists formed "the American Steamship Company," and decided in 1871 to try the experiment of an American Line to Liverpool. They contracted with the Cramp firm for four first-class steamships, to be superior in sea speed, comfort, and other desirable qualities to any foreign steamship then in service. These four ships were designed by Mr. Cramp, and built under his superintendence between 1871 and 1873 inclusive, and were put in service under the names of the "Indiana," "Illinois," "Pennsylvania," and "Ohio," now commonly known as the old American Line. That these

ships were designed with the highest degree of ability and constructed with the utmost skill is sufficiently attested by the fact that they are all in serviceable condition at this writing (1903), over thirty years old. These ships broke the record in speed which was held by the "City of Brussels," and consumed less than half of the coal in doing it.

As soon as the construction of these ships had been awarded to his Company, Mr. Cramp determined to examine the conditions of marine-engine development abroad, and with that object in view sailed immediately for Europe. His narrative of the trip and its results are as follows:

VISIT TO BRITISH SHIPYARDS.

"When the organization of the Company was perfected, the compound engine as developed by John Elder had made its appearance, and a fierce opposition to its introduction was made by engine-builders in Great Britain generally.

"Its advocates were among the ablest engineers in that country, foremost among whom was Mr. MacFarland Gray, whose unassailable attitude in its favor in the columns of 'Engineering' vindicated its claims and successfully established its introduction. While the idea was an old one and had been introduced before Watt's time, it failed, as most improvements do when they do not get into proper hands to be developed.

"To John Elder belongs the credit of its permanent

and practical introduction into ocean navigation, and but little improvement has been made in his work up to this time.

"Mr. B. H. Bartol, who occupied a high position for intelligence and sagacity in the business world and as a practical marine engineer of the highest attainments, was one of the directors of the new steamship company, and, desiring that the ships should be in advance of the times, he recommended that I should go to Great Britain and make an exhaustive examination of the compound-engine question.

"Mr. J. Shields Wilson, who had been selected by me as the engineer of our Company, which had recently added engine building as a department of its business, accompanied me. Mr. Wilson had already gone very deep into the investigation of the compound question, and had acquired a strong bias in its favor; and he had already designed the compound engines for the 'George W. Clyde.'

"Mr. Bartol recommended the steamship company to appropriate $10,000 to pay our expenses in the investigation, arguing that the money could not be spent in a better way, and that they could not get another party better equipped than we were to undertake it. He also stated that he would oppose the construction of any steamers until he became convinced that they would be of the most advanced type in everything that pertains to most modern requirements.

"The money was promptly appropriated, and with Mr. Wilson I took passage in the 'Italy,' the first trans-Atlantic steamer with compound engines of John Elder's make and type, whose reported performance in economical coal consumption was considered at that time marvellous.

"We soon made the acquaintance of the chief engineer of the ship, whose name also was Wilson, and Mr. Wilson

practically lived with him. He was permitted to take cards under varying conditions, and secured an accurate account of coal consumption and of all other matters likely to be of interest.

"When we arrived at Liverpool, we visited the Lairds', being the first English shipyard that either of us had ever visited.

"We then visited every great marine engine and ship-building works on the Thames and Clyde, beginning with the Thames, whose shipyards at that time stood higher in the *art* of ship-building and in the proficiency of marine-engine construction than the Clyde shipyards. When we started on our tour we determined to adhere to a fixed policy and procedure wherever we went, which was to frankly praise whatever we thought deserving of it and to adversely criticise whatever we thought deserved such criticism; and particularly to make no secret of the principal object of our visit.

"Our Company was practically unknown then in Great Britain, and steamship building was supposed to be an unknown art in America; but we were received with much cordiality and frankness, probably from mere curiosity, if nothing else.

"Fortunately for us, we visited the works of Mr. Zamuda first, where a capable engineer was delegated to show us around. It having been noticed that we had registered our names, one as ship-builder and constructor and the other as marine engineer, the Superintendent was anxious to have our dimensions taken. There was no time wasted, and our questions and remarks covering everything in sight or in the field of ship-building methods were showered on him in a deluge. He had expected to get through with us in a very short time, thinking that a sort of perfunctory visit 'in one door and out at the

opposite' would be sufficient; but finding that he had been mistaken, he sent a boy out with a note and soon received an answer. We spent the greater part of the morning there. When it became noon, he explained that he had sent a note out to Mr. Zamuda, stating that we were well up in everything pertaining to the business, etc. Mr. Zamuda's reply was to send us in to him when we were through. He received us with much consideration and politeness, invited us to take luncheon with him, and devoted much time to questions as to wages of workmen, materials, and where they were secured, prices, character of output, etc.

"When he found that we were doing considerable in the way of iron ship-building, principally coastwise, he was much astonished to know that most of the workmen as well as Mr. Wilson and myself were native to the soil, and he had much to say on the subject.

"When he had finished with us, and after we had informed him of the purpose of our visit and that we wanted to see the principal shipyards in the country, he stated that he would facilitate our purpose by giving us letters to the Superintendents of the principal places; explaining that they would take time to show us what was worth seeing, while, if we went to the office, we would only be hurried through in a careless manner.

"It was due to this act of kindness on his part that our visits afterward were so successful in the acquisition of valuable information, and as to the generous hospitalities that we received. We visited first the Thames Iron Works, John Penn & Sons, Mandsleys, and others. From the Thames we went direct to the Clyde, where we visited the Thompsons, the Lairds, Tod and McGregor, John Inglis, Elders, and some others.

"The consensus of opinion of the different shipyards on

the subject of compound engines was, as a rule, unfavorable. We found that the opposition was principally due to the fact that the change from the old type to the new involved important and radical modifications in the constructions of boilers and of engines, so they hesitated to discard their old plans, patterns, and methods, the value of which they were sure of, and to grope into an unknown field of augmented costliness.

"Of course, these arguments to us were not convincing, and as we advanced to the north we found ourselves quite biassed in favor of the new type. Whatever doubts we may have had up to the time of our arrival at the Fairfield Works, they were forever removed when we visited their magnificent erecting shop. We saw there *thirteen compound engines* in various states of completion, with their various parts ready for assembling, some about ready for installation in the ship, the whole exhibiting everything in the way of finish and arrangement both in their various parts and in the whole erection. Up to this time we had encountered engines of the oscillating type, the trunk, the plain vertical, and horizontal in every varying form and construction. It was the same old story,—an old one before we left home; and now, without any preparation whatever for it, this vision of thirteen actualities of the new departure burst upon our view. We spent the entire day there, the Superintendent affording us every opportunity to examine the parts and discuss the subject. We found as much novelty in the boiler construction as in the engine.

"An old Philadelphia boiler had made its appearance here as 'the Scotch Boiler'; this differed from the old one only in the thickness of the plates, due to the necessities of the use of higher steam.

"After this there was nothing to be seen, and we

hastened home, and in a very short time the Elder type of compound engines was under construction for our new ships practically before any of the various shipyards in Great Britain other than John Elders' took hold of them.

"To John Elder belongs the entire credit of introducing and perfecting the compound engine, and there has been but little improvement in his work up to this time. MacFarland Gray at that time was a persistent advocate of this engine, and his work on 'Engineering' was of great value. He took especial pains to aid us in our investigations.

"This trip was a most useful one besides the investigation of compound engines; it gave us an opportunity of examining every method pertaining to hull construction and equipment there, and to discuss all of the problems and methods belonging to it.

"Two great changes in mechanical method and practice in certain details of engine building took place in Great Britain as a result of our visit, and the arrival of the 'Pennsylvania,' the first of the American Line; although we took no active measures in that direction.

"We found during this trip that the art of flanging boiler-plates in Great Britain was entirely unknown, and that all British boiler-heads were secured to the side plates and to the furnace ends by means of angle bars in the corners, a crude and primitive method of construction. It was impossible for us to understand this backwardness or ignorance on the part of the British, as the flanging of boiler-heads had always prevailed here.

"We called the attention of the British builders generally to this superiority in boiler construction, but little or no attention was paid to what we said at that time; but when the four ships of the new line arrived in Liverpool, draughtsmen from all quarters were sent to make sketches

of the boiler work, and of many other devices new to them, besides the boiler construction, one of which was the use of white metal in bearings and journals. This feature in the engine construction the British had not taken up when we visited their works.

"We can claim to have introduced boiler flanging and the use of white metal in British ship construction on account of our recommendations, and the practical illustration of their utility on the arrival of the ships of the American Line.

"The builders there, however, were very slow in the general adoption of these methods. At first boiler-heads were delivered at engine-works flanged by the mills that made the plates, and Sampson Fox added boiler flanging to his business of making corrugated furnaces. Having seen a boiler furnished with corrugated furnaces by Sampson Fox in England, I introduced them in two yachts built for George Osgood and Charles Osbourne, the first furnaces of the kind in America. These yachts were known as the 'Corsair' and the 'Stranger.'"

The construction of the four pioneer ships went on as it had begun, without promise of aid from the government, which steadily maintained its attitude of neglect as to the national merchant marine, while hundreds upon hundreds of millions in the shape of guarantee bonds and public land grants were poured out by the Congress in favor of western railroads, but not one dollar for the merchant marine.

Still, notwithstanding these discouraging conditions, Mr. Cramp did not abate in the

slightest degree his endeavors to keep the needs of the country in the direction of a national merchant marine before Congress and the public. A compilation of the articles he published and of his statements before the committees of both Houses of Congress would, on the whole, fill several volumes like this one. It is therefore impracticable to reproduce here the actual text of his arguments and his expositions.

Newspaper organs of the foreign steamship interests published in this country denounced him as a "subsidy beggar" and other like epithets, which was all that they had to offer in answer to his deductions and arguments; but even that did not disturb the even tenor of his way.

Finally, in the Forty-seventh Congress, a joint select committee of three Senators and six Representatives was organized, of which Nelson Dingley, of Maine, was chairman; and this organization led to the formation of a new standing committee of the House known as the Committee on the Merchant Marine and Fisheries. Mr. Dingley's committee spent an entire summer in going from point to point on the sea-board and taking testimony and statements of all classes of business men interested in any way or informed to any responsible degree as

to the condition of the merchant marine and as to the possible or probable means to bring about its resurrection.

The investigation of the Dingley Committee led to the formulation of a comprehensive measure known as the "Dingley Shipping Bill." It was thoroughly and exhaustively discussed through three Congresses, until finally, in the last hours of the short session of the Congress ending March 4, 1891, a bill was passed providing for a meagre and wholly insufficient subsidy in the shape of special pay for carrying the ocean mails of the United States. This bill was not only meagre in its provisions, but it was not comprehensive in its application. It did not result in any immediate increase of foreign tonnage. The following year, however, Mr. Cramp, in a spirit of meeting the free-ship people half-way, agreed to a compromise which provided that certain ships of foreign (British) registry might be admitted to American registry, provided their owners would contract to build two ships of equal class and tonnage in the United States. This was the act by virtue of which the English steamships "New York" and "Paris," belonging to the International Navigation Company, an American corporation and owned by American capital, were brought un-

der the American flag, and the "St. Louis" and "St. Paul" were contracted for and built to meet the condition imposed by this law.

The principal dimensions and qualities of these ships are as follows:

Length between perpendiculars, 535 feet 8 inches.
Length over all, 554 feet 2 inches.
Extreme beam, 62 feet 9 inches.
Depth from first deck to flat keel, 42 feet 4 inches.
Depth of hold for tonnage amidships, 23 feet 2 inches.
Height of bow above water-line at load draught, 39 feet.
Number of decks, 5.
Number of water-tight compartments exclusive of ballast tanks, 12.
Gross register, 10,700 tons.
Load displacement (about), 15,600 tons.
Dimensions of main dining-saloon, 109 feet 4 inches by 46 feet.
Dimensions of second cabin, 39 feet 6 inches by 56 feet.
Seating capacity of main saloon, 322.
Seating capacity of second cabin, 208.
Berthing capacity of steerage (about), 900.

The propelling machinery is a pair of vertical inverted quadruple-expansion engines, to carry a working steam-pressure of two hundred pounds and develop from 18,000 to 20,000 collective indicated horse-power. These are the largest and most powerful marine engines ever built in America, and, as the principle of quadruple expansion has never before been

ARMORED CRUISER NEW YORK

applied on so large a scale, its results in this case have been watched with interest by the entire profession of marine engineering.

Structurally, the art of naval architecture has been exhausted in their design, and the skill of the best mechanics in the world was tried to the utmost in their construction. Whatever may have been their performance as to speed and time of passage, nothing is hazarded in saying that in safety, seaworthiness, and comfort they are not surpassed by anything afloat.

In the general public or patriotic sense the chief element of interest in these ships is the fact that they represent the inception of an effort to restore the prestige of the United States as a maritime commercial power. The condition of affairs existing at the time the new American Liners were projected was the culminating point of our feebleness on the ocean.

The Act of 1891 was framed to expire by its own limitation in ten years from its date. Taken in connection with the Act of 1892, already referred to, it brought about the construction of two first-class American trans-Atlantic greyhounds (the "St. Louis" and "St. Paul"). Other companies or lines running to the West Indies, Mexico, and South

America were also stimulated to build a few new ships, but, generally speaking, the effect of both these acts was limited, and produced no serious impression for the better on the American merchant marine in general.

This fact became evident very soon after these acts went into effect, and it became clear that a broader and more comprehensive policy must be adopted in the same direction if any great or lasting improvement of the condition of our merchant marine was to be expected.

This led to the framing of a new act, thoroughly comprehensive in its scope and universal in its application, on lines similar to those of the Dingley Bill of 1882, but broader.

Prior to 1891, Mr. Cramp had confined the statements, deductions, and arguments based upon his experience and observation wholly to hearings before committees of Congress, with now and then a newspaper interview, which in the nature of things must be transitory and soon forgotten. But in the fall of 1891 he determined to place his knowledge before the public in a more permanent form. This he began with a paper in the *Forum* for November of that year. The limits of this Memoir do not admit of the reproduction of this paper in its entirety. It filled sixteen pages of the *Forum*. The summary of the conclusion, how-

ever, may be reproduced. After an exhaustive analysis of the existing conditions and their causes, together with a survey of the probable effects of the act approved the previous March (March 3, 1891), Mr. Cramp summed up as follows:

"The commercial disadvantages resulting from a monopoly of our ocean-carrying trade by foreign fleets attracted public attention many years ago. From the first there was practical unanimity as to the existence of these disadvantages, and a like concurrence in the opinion that 'something ought to be done' to improve the situation; but upon the question of remedy there have always been wide divergences of view. It having been generally conceded that the remedy must at least begin in national legislation, the dispute has been simply as to what the character of that legislation should be. A certain faction contended that nothing was required beyond a simple repeal of the navigation laws, to permit the free importation and registry of foreign-built vessels; and bills to that effect have been introduced, and in many cases discussed, in nearly every Congress since 1870. In no case has a bill of this character passed both Houses of Congress, and but once has the measure received a majority in either House. That was in the Forty-seventh Congress, when a 'Free Ship Amendment' was proposed by Mr. Candler, of Massachusetts,—a bitter opponent of American shipbuilding,—to what was known as the 'Dingley Shipping Bill,' and Mr. Candler's amendment was attached to the bill by a small majority. The result of this amendment was to kill the bill. It is not my purpose to discuss the merits of this proposition, further than to say that what-

ever increase in American tonnage might accrue from it would be gained at the expense of the destruction of American ship-building. That may be set down as an axiom to be observed as a necessary factor in every discussion of the subject. As pointed out at the beginning of this paper, the ship-building industry in Great Britain has been developed to such enormous proportions, and the facilities of construction enlarged to such a scale, that our own comparatively few and feeble shipyards would be instantly overwhelmed in the competition the moment our market was thrown open to them to unload their old and worn-out wares on American 'bargain-hunters.'

"This fact is now so well understood, that I think there is no hazard in saying that a large majority of the best minds of all parties are convinced that the experiment of trying to augment our merchant marine by a policy calculated to destroy our ship-building industry would not be conducive to the general public interests.

"The other mode of remedy advocated has been that of adopting, in behalf of our own shipping, a policy similar to the one which has produced such striking results elsewhere; that is to say, public encouragement to the ownership and operation of American-built vessels in the foreign trade. This subject has for many years claimed a large share of the attention of Congress, commercial organizations, and the press. Its discussion has taken a wide scope, involving several exhaustive inquiries by congressional committees, numerous petitions and resolutions from boards of trades and chambers of commerce, with almost innumerable papers in the public prints, and speeches in our public halls; the whole forming what may be called the 'Literature of our Merchant Marine.' Its volume is so vast, that but the barest reference to its details can be made here. Suffice it to say, that it covers

every conceivable point at issue; and it has been so universally published, that no person of ordinary intelligence and education can have excuse for ignorance or misinformation on the subject.

"The results of this agitation and discussion have been bills in Congress from time to time, providing for a more liberal and enlightened policy on the part of the government toward the national merchant marine. Some of these bills proposed special compensations to particular lines for carrying the mails. Such bills have failed in consequence of the objection that they involved the principle of special legislation. Other measures proposed a general bounty based upon tonnage and distance actually travelled in foreign trade. This plan at the outset seemed more popular than any other, and there was at one time strong probability of its enactment into law. But it finally failed, partly on account of clashing of diverse interests, and partly by reason of 'party exigencies,' real or supposed, in the House of Representatives. It is hardly pertinent at this time to point out the benefits that would have accrued, directly and incidentally, to every branch of our national life and industry, from a tonnage law properly administered. I have never hesitated, and do not now hesitate, to declare that ten years of its operation would result in placing our merchant marine in the foreign trade on a footing second only to that of Great Britain in amount, and vastly superior to it in character and quality of vessels. And I still hope to see such a policy adopted at no distant day.

"I have gone into detail to this extent because it seemed necessary to do so in order to show that, loud as has been the outcry of 'subsidy' raised against the act recently passed, it is still, as a matter of fact, less liberal than

existing provisions of the British government for their own ships already in the trade to be competed for.

"Thus far I have dealt with facts only; and I have been careful to avoid any matter susceptible of controversy. In conclusion, I will venture a few deductions of my own, based upon the foregoing statements of simple facts. I will assume at the start that our internal development of farms, workshops, mines, railways, coastwise, lake, and river commerce, etc., has reached a point at which capital has reached its zenith of profitable investment in them, and must look for some new field, not only for further original investment, but also for the protection or betterment of investments already made. In my judgment, our energy and enterprise during the last twenty-five years have exhausted all the large chances of fortune within the boundaries of the United States. Our existing industries of every description represent an enormous volume of local 'plant' and productive organizations quite up to our local requirements for some time; hence it is necessary to seek outlets for an inevitable surplus of product, and, in default of such outlet, there must be a plethora of production which is bound to result in stagnation, or, in other words, national apoplexy. For this there can be but one preventive, 'an ounce' of which is said on traditional authority to be 'worth a pound of cure,' and that is in the development and retention of external market outlets. It is my opinion that we can never secure these until we can ourselves command the avenues to them. Commerce has its 'strategy' no less than war. In war, strategy depends on lines of operation and communication. At this time we possess neither for either commerce or war. Our great rival controls both in every sense of the word. To-day we could not even defend our own coasts against her obsolete ironclads in war, and we can-

not control our own foreign commerce as against the poorest and least seaworthy of her myriad of 'ocean tramps.' If, for any reason, she were to withdraw from our trade the vessels which, by virtue of our acquiescence, do all our trans-Atlantic fetching and carrying for us, our peerless nation would be laid helpless under an embargo compared to which that of Jefferson's administration would be but a mere trifle of annoyance. It has seemed strange to me that so little attention is paid to this fact. What would our political independence be worth, if circumstances, likely to occur at any moment, should visit upon us the consequences of our commercial servitude to England? and in a less, though still important, degree to Germany?

"This is a plain statement of fact that I do not think any reasonable person will have the temerity to dispute. For the present I have only to add, that we have done nothing as yet to lift this yoke from our necks. It cannot be done except by restoring our merchant marine and our naval power to their former status upon the high seas. The attempts thus far made in that direction are but feeble. I am not sanguine that they will be strong in our time, but I hope so. It may be that this result will not come until we have received a sterner lesson of our weakness and helplessness than any one now anticipates.

"This pitiable condition on the ocean is emphasized by the contrast of our unrivalled power, resource, and enterprise within our own borders. It seems, indeed, the strangest anomaly of modern civilization, that the most enlightened, most ambitious, most energetic, most productive, and internally most powerful nation on the globe should be externally among the weakest, most helpless, and least respected.

"The sole remedy for this situation is ships with sea-

men to handle them, whether for peace or for war; whether to carry our enormous exports, and bring our immense imports, and receive therefor the tremendous tolls which now flow into foreign coffers, or to vindicate the majesty and power of our flag abroad in the world to a degree befitting our status in the community of nations.

"There is no lack of raw material, no lack of skill to fashion it into the instruments of commerce. We have the iron and the steel; we have the men to work them into the finished forms of stately ships; we have the money to promote the most colossal of enterprises by sea. All we need is assurance of a steady national policy of liberal and enlightened encouragement, based upon a patriotic common consent, and elevated above the turmoils of politics or the squabbles of parties. One decade of such a policy would make us second only to Great Britain on the high seas, either for commerce or for defence; and two decades of it would bring us fairly into the twentieth century as the master maritime power of the globe."

These observations, though written and printed in 1891, are as true and pertinent now as they were then; and they will remain true and pertinent indefinitely because they embody the practical logic of a situation; they point out the consequences it entails, and they suggest the only remedy that has been approved by the cumulative experience of other nations. The lines of fact are broad, plain, and unmistakable. No one disputes them.

As before remarked, a quite brief experience demonstrated that the Ocean Mail Pay Act of March 3, 1891, was both inadequate in its scope of operation and insufficient in its volume of aid to produce any marked betterment of the condition of our foreign trade. The restricted nature of its application and the comparatively small amounts paid were not sufficient to encourage the establishment of new lines, the opening of new sea routes, or the construction of new and up-to-date vessels under the American flag. One result of this development was the formation of a committee, composed of the most prominent shipbuilders and ship-owners in the country, known as the Committee on the Merchant Marine. Of this committee Mr. Cramp was one of the originators, and always among the most prominent and active members. Its object was to concentrate the power of individuals in a concerted body for the purpose of furnishing facts and disseminating knowledge with regard to the condition of the merchant marine and its needs not only in Congress, but also among the people throughout the country. Hitherto the efforts of individuals had been exerted singly and often divergently; but it was hoped and believed that, by the organization of this committee and

through the concerted action which would result from its deliberations and researches, a harmonious and uniform scheme might be brought forward which would ultimately command the public support of all men animated by a patriotic desire to see the American flag restored to its former proud rank on the high sea.

The first result of this policy was the formulation of a bill based upon tonnage and distance travelled. It was to some extent analogous to the system then prevailing in France commonly known as the tonnage bounty system.

When this bill was first brought forward, being introduced by Mr. Frye, of Maine, in the Senate, and by Mr. Dingley, in the House of Representatives, the foreign steamship owners or their agents in this country at once became greatly alarmed. They had not offered a very vigorous resistance to the passage of the Ocean Mail Pay Act of 1891, because their knowledge of the business and their keen sense of the situation taught them that there was not much danger to their interests in that bill. They made a show of opposing it, of course, but they spent very little money or time and made no really determined effort to beat it. In fact, the foreign steamship owners and the

managers of the foreign lines which were doing the ocean-carrying trade of the United States realized before that bill became a law what it took our people two or three years to find out. But when the tonnage bounty bill was brought forward, with the general applicability of its provisions to all kinds of vessels engaged in the foreign carrying trade, and proposing, as it did, a rate of bounty which would have gone far toward equalizing the difference in cost of seafaring labor and subsistence as between American and foreign ships, the owners and managers of the steamship lines * and tramps that were carrying the commerce of the United States determined

* These managers of foreign lines proceeded systematically. Whatever may have been the activity of their competition for the carrying trade of the United States, they were unanimous in their determination to prevent the growth of an American merchant marine. Acting under the guise of a pretended business combine, which, for convenience, they termed "The North Atlantic Traffic Association," they raised funds, hired lobbyists,—among whom appeared ex-officials of positions as high as the Cabinet,—and by every possible means known to modern ingenuity thwarted every effort of those favoring American interests, both in and out of Congress. This combination has no reason for existence except that of organized and systematic lobbying against American interests in the corridors and committee rooms of the American Congress.

that it must be beaten at all hazards and at any cost. This struggle began in 1894. The original tonnage bill passed the Senate, but was smothered in the House. The owners and managers of the foreign steamship lines could not control the Senate, but they appeared able to affect the action of the House of Representatives negatively, at least, if not positively.

A similar measure was brought forward again in the Congress elected with President McKinley in 1896, and the bill passed the Senate, again to meet the same fate as its predecessor in a Republican House of Representatives with a thorough working majority, notwithstanding that the policy of aid to American shipping had been a cardinal plank in the platform of that year, upon which that House had been elected. The defection was almost wholly among Western Republicans.

During the contest over the bill in the Congress under consideration, the tactics of the foreign steamship owners and managers, personally as well as through their hired agents, were a disgrace to the good name of American legislation. They threw off all disguise and openly lobbied on the floors and in the corridors and committee rooms of the House to prevent consideration of the bill. In that Congress there was every prospect that if the Senate Bill

BATTLESHIP NEW IRONSIDES

could be brought up for consideration it would pass with some trifling amendments, which could easily be adjusted in conference committee. The whole strategy of the alien shipping interests was to prevent consideration, which they ultimately succeeded in doing by working upon the susceptibility or the apprehensions of certain Republicans from the far Western States.

In 1898, the tonnage bounty bill in a modified form was brought forward again; this time with a limitation of the amount to be expended under its provisions in any one fiscal year to nine millions of dollars, but it met the same kind of opposition that had beaten its two predecessors, and it shared their fate, passing the Senate and being denied consideration in the House.

Finally, in the Congress elected in 1900 and assembling in 1901, a tonnage bill still further modified was brought forward and passed the Senate. For a time it was believed that the alien ship-owners and managers would not be able to beat this bill as they had its predecessors, and strong hopes were indulged by its friends that it would receive consideration in the House. Even up to the last few weeks of the closing session of the Fifty-seventh Congress which expired March 3, 1903, the Chair-

man of the Committee on Merchant Marine and other advocates and friends of the bill believed that they would be able to get a rule for its consideration even at the last moment. But that hope, like all the others, passed away.

To go back a little, it may be worth while to remark here that the national misfortune did not even end with the failure of these bills, and the consequent continued depression or paralysis of the American foreign carrying trade. There was from time to time sufficient prospect, or at least possibility, of the passage of a practical and effective law for the aid and encouragement of American shipping to induce the investment of a large amount of capital by sanguine persons in new ship-building plants of considerable magnitude, whereby the trade as it stood was not only greatly overdone, but the skilled ship-building labor of the country was overdrawn. There seemed to be a theory that plenty of money to invest in plant or to sink in unprofitable enterprises could be depended on to make up for the lack of experience in the management of shipyards and want of skill in ship-building labor. The result was disastrous not only to the investors in the stock and bonds of the new shipyards, but also to the entire ship-building industry, as it had

been developed on a practical and legitimate basis.

With the final failure of all legislation to promote American commerce in the foreign carrying trade, there was no resource left for either the new shipyards or the old except such work as the coastwise trade might provide and the construction of naval vessels. As for the coastwise trade, it was already well provided with new and highly serviceable steamships likely to fill the demands of the traffic for several years to come, so that little or no new work could be expected from that quarter.

The naval programme did not in any year put forward as many ships as there were shipyards. The government itself seemed to adopt the policy of fostering and promoting the new shipyards at the expense of the old, whereby the former were overloaded with work which they could not do, and they invariably became so hopelessly delinquent as to make the time clause of the contracts an utter farce. New shipyards, which had never completed a ship of any description, were loaded with 15,000 and 16,000-ton battleships of the most complex and difficult construction, requiring the highest skill and the most approved experience in every respect to carry on the work required for their completion.

It is not necessary to particularize further on this point, except to say that very large and important vessels, awarded to new and inexperienced concerns with a contract time for completion of three years, could not by any possibility be finished inside of six or seven. So the question naturally has arisen as to whether, in the formulation of its ship-building programmes or in its output of awards to contractors, the government really desires to augment its naval force in the shortest possible time or to figure as a good Samaritan toward new, inexperienced, unskilled, and needy shipyards, owners, and managers. Such a policy is based upon the fundamental error that what is called "plant" makes a shipyard. The real shipyard is not merely ground, waterfront, buildings, and machinery, commonly called plant; but with a thoroughly organized *personnel* in staff and working-men; with a generation or more of training and experience behind them. That is a complete shipyard. So far as mere plant is concerned, the size of a new shipyard or the amount of money spent on it cannot create a range of capabilities. The indispensable and over-ruling requisite is the trained staff and trained men that are in it. The lay-out of land, buildings, and machinery is but a small factor in the operation of an

effective shipyard. Another thing to be primarily considered is that there are no enterprises of industrial, railroad, or mining interest that can be compared with a large modern shipyard for intricacy of professional and mechanical subdivisions in its organization.

Every handicraft or mechanical pursuit is to be found in such a shipyard or closely correlated with and contributory to it. The grouping of these diverse elements into a harmonious working whole needs the hand not only of a master, but a master of long continuous training; and in the adjustment of the various parts of the group, it is time, experience, and knowledge of the men composing it which are indispensable.

Returning now to the main theme, it seems proper to explain what the real bone of contention is in this struggle between the impulse of American patriotism and the greed of foreign ship-owners. It all goes back to the fundamental navigation laws of the United States which prohibit the registry of any foreign built ship under the American flag except in certain cases provided by law, which are not sufficiently numerous to be formidable.

In their warfare against government aid and encouragement to American shipping, the for-

eign ship-owners and ship-builders have not met the issue squarely or fairly face to face. They have invariably resorted to a subterfuge which is commonly known as the doctrine of free ships, the meaning and significance of which are not understood by the general public, and its consequences are realized most imperfectly, if at all.

The phrase viewed as a glittering generality is seductive, and it is regarded by many people as a mere proposition to enable American ship-owners to buy their ships where they can get them the cheapest, as the saying is. It is a curious fact that, with all the learning and the so-called logic of political economists, they have never yet, from Adam Smith down, clearly defined to us what really constitutes cheapness in all its elements, or what constitutes the reverse, or costliness. A mere difference in dollars and cents for a given thing to perform a certain work by no means expresses the difference. It may, and often does in fact, befog or confuse the mind. A bad or poorly constructed thing may be called cheap, and a good, well-constructed thing may be termed costly, measured by dollars and cents, and yet practically, in view of efficiency, durability, and all the other elements of desirability, the so-called costly thing may be actually cheaper

than the so-called cheap thing, both being intended for the same purpose.

A free ship law, or the repeal of our existing navigation laws, would unquestionably load our registry with ships cheap in dollars and cents, but they would prove dear in everything else. In order to do what lay in his power to correct these misapprehensions and clear away this fog of ignorance on that particular subject, Mr. Cramp, in the *North American Review* for April, 1894, printed a paper entitled "Our Navigation Laws."

In the course of this paper he called attention to certain facts of permanent historical value which there seemed a tendency to forget or ignore:

"At the time of the Franco-German War of 1870–71, even so sturdy a patriot as General Grant, then President, was persuaded for a time that it would be a good thing for our commerce, as a neutral nation, to permit American registry of foreign-built vessels, the theory being that many vessels of nations which might become involved in the struggle would seek the asylum of our flag.

"Actuated by powerful New York influence, already conspicuously hostile to the American merchant marine, General Grant, in a special message, recommended that Congress enact legislation to that end. This proposition was antagonized by Judge Kelley, of Pennsylvania,—always at the front when American interests were threatened,—in one of his most powerful efforts, couched in the

vehement eloquence of which he was master, which impressed General Grant so much that he abandoned that policy, and subsequently adhered to the existing system.

"I will not stop here to point out in detail the tremendous political and diplomatic advantage which England would enjoy when dealing with other maritime powers, if she could have always at hand an asylum for the lame ducks of her commercial fleet in time of war. Her ocean greyhounds, that could either escape the enemy's cruisers or be readily converted into cruisers themselves, might remain under her flag; but all her slow freighters, tramps, and obsolete passenger boats of past eras would be transferred by sham sales to our flag, under which they could pursue their traffic in safety during the war under peace rates of insurance, and without any material diversion of their earnings, which would of course be increased by war freight rates, returning to their former allegiance at the end of the war. The lack of such an asylum amounts to a perpetual bond to keep the peace.

"From the end of the Civil War to about 1880 there was but feeble effort to revive ship-building in this country. All our energies of capital and enterprise, as I have remarked elsewhere, were directed to the extension of railways in every direction, to the repair of the war ravages in the South, to the settlement of the vast territories of the West,—in a word, to purely domestic development, pending which England was by common consent left to enjoy her ocean monopoly.

"Such was the state of affairs in 1883-85, when the adoption of the policy of naval reconstruction offered to American ship-building the first encouragement it had seen in a quarter of a century.

"When we began to build the new navy, every English

journal, from the *London Times* down, pooh-poohed the idea that a modern man-of-war could be built in an American yard, modern high-powered engines in an American machine-shop, or modern breech-loading cannon in an American forge. Many of the English ship-builders rubbed their hands in actual anticipation of orders from this government for the ships and guns needed; and they blandly assured us that they would give us quite as favorable terms as were accorded to China, Japan, and Chili. And, to their shame be it said, there were officers of our navy who not only adopted this view, but did all they could to commit our government to the pernicious policy.

"In 1885, when Secretary Whitney took control of the Navy Department, the efforts of English ship-builders to secure at least a share of the work were renewed. By this time the English were willing to admit that the hulls of modern ships could be built in the United States; but they were satisfied that our best policy would be to buy the necessary engines, cannon, and armor from them. Secretary Whitney, however, promptly decided that the only article of foreign production which the new navy needed was the plans of vessels for comparison. This was wise, because it placed in the hands of our builders the results of the most mature experience abroad, at comparatively small cost. But one of the earliest and firmest decisions of Mr. Whitney was that our naval vessels, machinery and all, must be built at home and of domestic material.

"The efforts of the English builders to get the engine-work for our new navy were much more serious and formidable than is generally known. A prominent member of the House Committee on Naval Affairs proposed an amendment to a pending naval bill empowering the Secretary at his discretion to contract abroad for the construc-

tion of propelling machinery for our naval ships. The language was, of course, general, but every one knows that the term 'abroad' in this sense would be synonymous with Great Britain, and nothing more.

"Mr. Whitney promptly met this proposition with a protest in the shape of a letter to the Naval Committee dated February 27, 1886. He said that, so far as he was concerned, he would not avail himself of such a power if granted. There was no occasion for such power; and it could have no effect except to keep American builders in suspense, and thereby augment the difficulty of obtaining capital for the enlargement of their facilities to meet the national requirements. Mr. Whitney's protest was so vigorous that the proposition died from its effects in the committee and has been well-nigh forgotten. The proposer himself became satisfied that he had been misled by the representations of naval officers who were under English influence, and did not press his amendment.

"I have brought these facts forward for the purpose of emphasizing my declaration that the promotive influence behind every movement against our navigation laws is of British origin, and whenever you put a pin through a free-ship bill you prick an Englishman.

"The portion of Mr. Whitney's letter referring to the proposed free-engine clause in the Naval Bill of 1886 was as follows:

"'I think our true policy is to borrow the ideas of our neighbors as far as they are thought to be in advance of ours, give them to our ship-builders in the shape of plans; and, having this object in view, I have been anxious to acquire detailed drawings of the latest machinery in use abroad, and should feel at liberty to spend more in the same way in getting hold of the latest things as far as possible for the purpose of utilizing them. We

have made important accumulations in this line during the last six months. I think I ought to say to the committee that I have placed myself in communication with some of the principal marine-engine builders of the country within the last three months for the purpose of conferring with them upon this subject. I detailed two officers of the navy,—a chief engineer and a line officer,—who, under my directions, visited the principal establishments in the East. They recognize that in the matter of engines for naval ships we are quite inexperienced as compared with some other countries. It is this fact, doubtless, which the committee has in view in authorizing the purchase and importation of engines for one of the vessels authorized to be constructed under this act. If the committee will permit me to make the suggestion, I find myself quite satisfied, after consultation with people engaged in the industry in this country, that it would not be necessary for me to avail myself of that discretionary power in order to produce machines of the most advanced character. Our marine-engine builders in general express their inability at the present moment to design the latest and most approved type of engines for naval vessels,—an inability arising from the fact that they have not been called upon to do anything of importance in that line. At the same time, they state that if they are given the necessary time, and are asked to offer designs in competition, they would acquaint themselves with the state of the art abroad and here, and would prepare to offer to the government designs embodying the latest improvements in the art. And they are ready to construct at the present time anything that can be built anywhere else if the plans are furnished. As I find no great difficulty in the way of purchasing plans (in fact, there is an entire readiness to sell to us on the part of the engine-builders abroad), I

think the solution of the question will be not very difficult, although it may require some time and a little delay.'"

At this writing (1903), only eighteen years have elapsed since the date of Secretary Whitney's letter. The wisdom of his policy needs no eulogy beyond the history of the development of steam-engineering in the United States during that brief period. In fact, no other eulogy could be a tenth part as eloquent as that history is.

The policy of Secretary Whitney was in fact an echo of the sturdy patriotism that framed the Act of December 31, 1792, dictated by the same impulse of national independence and conceived in the same aspiration of patriotic pride.

And now, in the face of this record so fresh and recent, the same old demand for English free ships is heard again in our midst, promoted by the same old lobby and pressed on the same old lines. Are we never to hear the last of it? Is there to be a perennial supply of American legislators willing to promote a British industry by destroying an American one? To all history, to all logic, they oppose a single phrase: "Let us buy ships where they are cheapest." Well, if national independence is valueless, and if everything is to be subordinated to cheapness, why not get our laws

BATTLESHIP IOWA

made in the House of Commons? The members of the House of Commons legislate for nothing. Senators and Representatives charge $5000 a year for their services, besides stationery allowance and mileage. The House of Commons makes laws cheaper than our Congress does. Our ships and our capacity to create them are as much a symbol of independence as our laws are; and if it is good policy to get the former where they are cheapest, why not get the latter on the same terms?

British warfare against American ships and shipping by no means stopped at extravagant subsidies to her own ships; did not stop at determined, and thus far successful, efforts to defeat American legislation of a similar character; did not even stop at vigorous and often corrupt attacks upon our navigation laws through the lobbies of our own Congress.

Of course, all these considerations at this writing (1903) have become ancient history. The iron ship has not only completely dominated British naval architecture, but that of all other European countries, and has established itself on an equally permanent and secure footing in the United States. A few wooden ships are still built in this country, but they are mostly schooners for the coastwise trade, and really cut little or no figure in commercial con-

ditions outside of our own coast. Yet, although it be ancient history, viewed in the light of the enormous changes that have occurred in thirty or thirty-five years, still, it is instructive to know the springs and motives of the public statecraft and the private commercial strategy which forced the iron ship in and the wooden ship out. That this was bound to come in the nature of things does not admit of doubt; but it is equally clear that the policy of interested parties forced the situation in favor of British shipping interests, and at the time adversely to those of the United States both as to ship-owning and as to ship-building, which are inseparably interdependent.

In 1897, Mr. Cramp, being prevented by other business from attending a hearing before the Committee on the Merchant Marine on the day set for his appearance, addressed to it a letter, in which, after briefly reviewing the conditions and causes already set forth, he said:

"The interests of ship-owning and ship-building are identical, because no nation can successfully own ships that cannot successfully build them.

"No nation can either own or build ships when, unprotected and unencouraged, if it is brought in competition with other nations that are protected and encouraged.

"This is the existing condition of the ship-owning and ship-building interests of the United States.

"The resulting fact is that the enormous revenue represented by the freight and passenger tolls on our commerce and travel is constantly drained out of this country into British, German, and French pockets, in the order named, but mainly British; while the vast industrial increment represented by the necessary ship-building inures almost wholly to Great Britain.

"For this drain there is no recompense. It is sheer loss. It is the principal cause of our existing financial condition.

"So long as this drain continues, no tariff and no monetary policy can restore the national prosperity.

"Until we make some provision to keep at home some part at least of the three hundred and odd millions annually sucked out of this country by foreign ship-owners and ship-builders, no other legislation can bring good times back again.

"It is a constant stream of gold always flowing out.

"The foreign ship-owner who carries our over-sea commerce makes us pay the freight both ways.

"For our exports we get the foreign market price less the freight.

"For our imports we pay the foreign market price plus the freight.

"No fine-spun theory of any cloistered or collegiate doctrinaire can wipe out these facts.

"The fact that so long as the freight is paid to a foreign ship-owner, so long will it be a foreign profit on a foreign product, is fundamental and unanswerable.

"The English steamship is a foreign product, and its earnings, which we pay, are a foreign profit.

"No sane man will argue that a foreign profit on a foreign product can be of domestic benefit.

"Add to this the fact, equally important, that the carrier of commerce controls its exchanges, and the con-

dition of commercial, financial, and industrial subjugation is complete. Such is our condition to-day.

"Great Britain has many outlying colonies and dependencies.

"The greatest two are India and the United States.

"She holds India by force of arms, whereby her control of that country costs her something. She has to pay something for her financial and commercial drainage of India.

"She holds the United States by the folly of its own people, whereby her control of this country costs her nothing. She has to pay nothing for her financial and commercial drainage of the United States.

"But the amount of her annual drainage of gold from the United States far exceeds that from India.

"Therefore the United States is by far the most valuable of all the dependencies of Great Britain.

"In the relation of India to England there is something pitiable, because India is helpless.

"In the relation of the United States to England there is nothing that is not contemptible, because it is the willing servitude of a nation that could help herself if she would.

"England is wide awake to those conditions, and keenly appreciates their priceless value to her.

"The United States blinks at them, half dazed, half asleep, insensible of their tremendous damage to her.

"England, clearly seeing that in this age more than ever before ocean empire is world empire, strains every nerve to perpetuate her sea power and exhausts her resources to double-rivet the fetters which it fastens upon mankind.

"Though in 1885 England already had a navy superior to those of any two and equal to those of any three other

powers, if not to all others, she has since that date built a new navy which, with what remains most available of the old one, overshadows the world, and makes the sea as much British territory as the County of Middlesex."

While this contest was going on between American ship-owners and ship-builders on the one hand and the alien combinations who control our ocean commerce on the other, a vast amount of American capital was gradually invested in shipping under the British flag, and at least an equal amount awaited any reasonable encouragement to build ships in this country to sail under the American flag. Of course, it would have been folly for the men who controlled this capital to invest it in American ships with a clear handicap of at least 15 to 20 per cent. against them in operating expenses, ton for ton, in competition with the aided, fostered, and subsidized fleets of England, Germany, and France. For a long time this mass of capital was held in hope of the adoption of a policy by our government that would tend to lift the handicap and equalize as far as possible the burdens of operating American ships as compared with others. But when Congress adjourned March 4, 1901, leaving the shipping question where it had been ever since the Civil War, and offering, if possible, less hope than ever before, the mass

of American capital that had been held back was let loose. Soon rumors that a great merger of British steamship lines with the International Navigation Company was in progress filled the air. It soon appeared that there was plenty of American capital to invest in ships under foreign flags, but none under the American flag so long as the existing situation might last. The ship-owners may have been patriotic, but their patriotism was not enthusiastic enough to make them willing to pay a penalty of 15 to 20 per cent. for the sake of it. This movement soon took shape in the organization of the International Mercantile Marine Company, in which was merged the control and management of the International, the White Star, the Leyland, and the Atlantic Transport Lines; the whole forming by far the greatest aggregation of vessels and tonnage ever grouped under one control. This control was American,* but the ships were of British registry except six, built by the Cramps and several others,—the "St. Louis," "St. Paul," "Kroonland," and "Finland," American built, and the "New York" and "Philadelphia" (formerly the "Paris"), British built,

* Since this was written, the whole ownership of the Line is British.

but admitted to American registry by the special Act of 1892.

The Americans were determined to own and operate ships. They would have preferred to run them under the American flag, but Congress—or rather a fraction in the House of Representatives—compelled them to use the British ensign! The commercial and financial effect of this was that the American investors got the benefit of the lower wages and cheaper subsistence of foreign seafaring labor. The vessels were American as to ownership only. No American officer or seaman or engineer or fireman was employed in them. They added nothing to the sea power of the country; they did nothing toward forming a nursery of American sailors to be in readiness for an emergency. On the contrary, they were a constant school for the Naval Reserve of a power that might become as hostile politically as she has been industrially and commercially from the beginning of our existence as an independent nation. None of these great facts appealed to the narrow and demagogic faction in the House. They could see in it nothing but "a trust," and their parrot-cry resounded from the banks of the Wabash to the foothills of the Rocky Mountains.

Many men, hitherto hopeful, believe that any

further effort to restore our foreign carrying trade under the American flag must be in vain. They argue that, if the Houses of Representatives elected in 1898 and 1900 would not pass a Shipping Bill, none can ever be chosen that will. If foreign influences and alien doctrines could prevent consideration in those two Houses of bills that had already passed the Senate in each Congress, those influences and those doctrines are likely to maintain their potency indefinitely. If this be true, the American flag in the foreign trade is doomed to utter extinction within a few years on the Atlantic Ocean, and its survival in the Pacific is a matter of extreme doubt .

A strange feature of this contest in its later stages was the fact that the confederated trades-unions of the country arranged themselves unanimously against the American and in favor of the alien policy. Trades-unionism is founded upon a doctrine or dogma of protection more sweeping and more drastic than any other ever known. They cheerfully maintain and sometimes exultantly proclaim that, when nothing else will serve to accomplish their ends, violence and crime become logical and legitimate instrumentalities for enforcement of their protective doctrine. They take no account of the fact that the enactment of a

favorable shipping law would open new and wide avenues of remunerative employment for American mechanics that are now closed. Their motive in opposing such legislation seems to be a sort of blind, groping revenge against a few ship-builders and ship-owners who have resisted their unreasonable and ruinous demands. It is a remarkable fact that the leaders and managers of the confederated trades-unions are all foreigners.

Naturally, such organizations, so led, fall easy dupes to the wiles of the alien ship-owners, who have never left any stone unturned or any expedient untried to defeat or smother in our own Congress legislation calculated to promote and extend our merchant marine.

Whatever the distant future may bring forth, there seems to be at this time and for the near future as little prospect of the development of a new and purely American merchant marine in the foreign trade as there has been at any time since the old one was destroyed.

Whatever may be the fate of the American merchant marine, it cannot be said that during the campaign for its resurrection, lasting almost continuously for over thirty years, Mr. Cramp has ever withheld from its advocacy

any part of his knowledge, study, observation, and experience; and if, partly through the feebleness of our own patriotism in legislation and administration, and partly through the superior and more aggressive patriotism of foreign ship-owners and ship-builders, the American merchant marine should become extinct, it will not be his fault.

CHAPTER IV

Condition of Navy after Civil War—Admiral Case's Fleet—"Virginius's" Scare—"Huron," "Alert," and "Ranger"—Secretary Hunt—First Advisory Board—Secretary Chandler—"Puritan" Class—Finished—Steel—Hon. J. B. McCreary and Appropriation Bill for New Navy—Members of Second Naval Advisory Board—Standard for Steel for New Ships, "Chicago," "Boston," "Atlanta," and "Dolphin"—Secretary Whitney—Beginning of New Navy, by Charles H. Cramp—"Baltimore," "Charleston," and "Yorktown"—Purchase of Drawings by Navy Department—Commodore Walker—Premium System—Mr. Whitney's Views—Premiums Paid—Attack on System—Secretary Tracy—War College Paper—Classifying Bids.

AFTER the Civil War the navy was neglected, being, so far as its cruising vessels were concerned, a wooden navy of not only obsolete types, but decayed or decaying vessels, which gradually became a reproach to the country and a laughing-stock for other maritime powers.

At the time of the "Virginius's" difficulty with Spain, which occurred about five years after the close of the Civil War, a "grand fleet" was assembled at Key West under the command of Rear-Admiral Case. This fleet

consisted of a large number of wooden cruising steamers of various types and classes, all obsolete, many of them unseaworthy, and all incapable of meeting an up-to-date ship of that period (1874–75) with any chance of success whatever. To these wooden hulks were added the double-turreted monitors "Terror," "Amphitrite," and "Monadnock," which were built at the navy-yards of wood, and a batch of old worn-out single-turreted monitors. The bottoms of the wooden monitors were so weakened structurally that, whenever an effort was made to wedge up the spindles so that the turrets could revolve, the bottom went down instead of the turret going up, the latter necessarily remaining immovable. Unquestionably any one, or at most any two, of our first-class modern battleships at this writing, 1903, could have annihilated and sunk the entire fleet in two or three hours, although it consisted, all types and classes taken together, of over forty vessels. This was an object lesson, and it to some extent aroused the sensibilities of the country; but the then existing administration of the Navy Department was under the absolute control of the navy-yard rings, and all naval work of every description was done in navy-yards. The " Spanish Scare," as it was called, did, however, have the effect of spur-

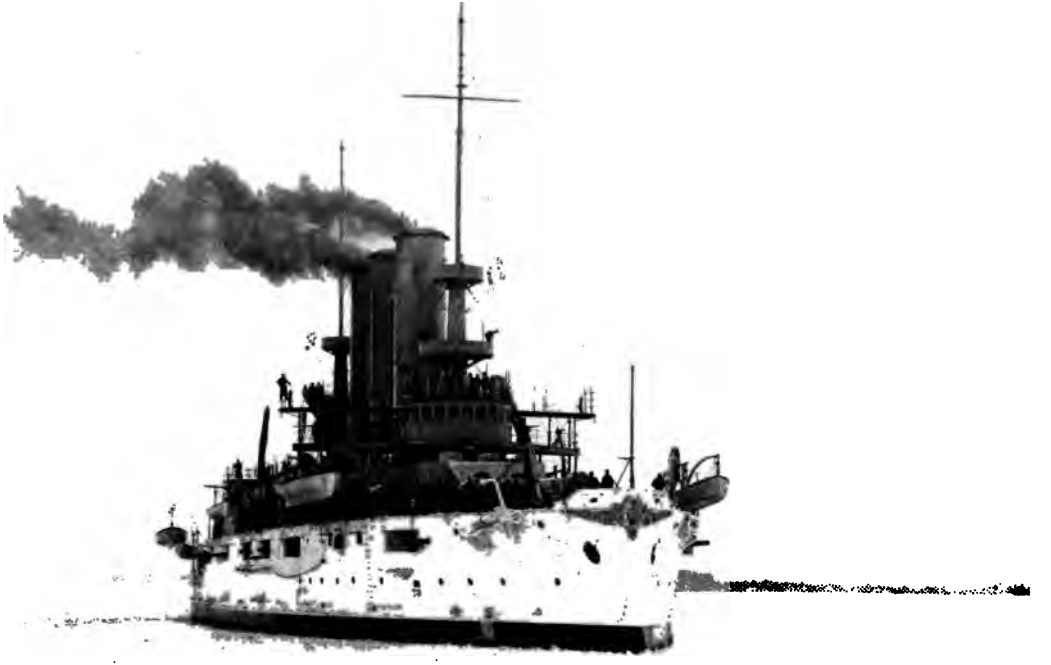
BATTLESHIP ALABAMA

ring Congress to provide for the construction of eight (8) new vessels, the first provided for since the Civil War. Of these, three were given out to be built by contract; two, the "Huron" and "Alert," small iron sloops-of-war or gun-vessels, were given to John Roach and built at his works at Chester; and another of the same class, the "Ranger," was given to Harlan & Hollingsworth, of Wilmington, and built there. The other five were built in navy-yards, and were completed at different periods between 1875 and 1879.

With this exception, nothing whatever was done toward increase or betterment of our naval force from 1865 until 1883. However, in 1881, General Garfield, having been elected President the preceding year and inaugurated the 4th of March, 1881, appointed Judge William H. Hunt, of Louisiana, Secretary of the Navy. General Garfield understood the naval needs of the country, referred to the subject vigorously in his inaugural, and quite early in his administration, or about a month before he was assassinated, prompted his Secretary of the Navy to take measures looking to the modernization of our national marine. The result of this was the convening of a board early in the summer of 1881, of which Admiral John Rodgers was President. The instruc-

tions of this board were to investigate the existing state of foreign navies, to inquire into the immediate needs of our own, and to formulate a ship-building programme on modern lines, to be carried out as soon as the resources of the country would permit. On the 7th of November, 1881, this board, which is commonly known to history as the "First Naval Advisory Board," reported in accordance with its instructions. It is not necessary here to go into detail with regard to the ship-building programme which they recommended. Suffice to say, that not one of the ships or types of ships which they recommended was ever actually built; but their deliberations and report attracted general public attention, caused the subject to be widely and patriotically, although not very intelligently, discussed in the newspapers, so that, while the action of this first Naval Advisory Board did not produce any actual or visible results, it at least served to popularize the subject of the "New Navy."

In 1882, Mr. Hunt was appointed Minister to Russia, and was succeeded in the Secretaryship of the Navy by William E. Chandler, of New Hampshire. Mr. Chandler was a vigorous, active man, and lost no time in taking advantage of the public interest which had been aroused. The result of the further in-



BATTLESHIP MAINE

vestigations and reports which he caused to be made, and his communications to the President, and through the President to Congress based thereon, resulted in an act, approved March 3, 1883, providing for the construction of four new cruising vessels, and the launching and engining of the four double-turreted monitors "Puritan," "Terror," "Amphitrite," and "Monadnock," which at that time had been on the stocks about eight years. These were built of iron, and took the places in the Navy Register of the worthless wooden monitors of the same names.

On the first lot of new vessels and engines, the bids were all considerably below the cost estimated by the Advisory Board and the Bureaus, and the contracts were let as follows: For the four vessels, and the engines of the "Puritan," monitor, to Mr. John Roach; for the engines of the "Terror," monitor, to William Cramp & Sons; and for the "Amphitrite," monitor, to the Harlan & Hollingsworth Company, of Wilmington, Delaware. Work under all these contracts proceeded with commendable alacrity.

Considerable difficulty was at first experienced in procuring material for the new steel ships. The standard established by law was very high, and the methods of test devised by

the board, to say the least, did nothing to ameliorate the rigors of the statute. The steel-makers, however, bravely persevered, and finally overcame their difficulties in the main, though a historical *résumé* of the progress of the new navy would be incomplete without the statement that none of the contractors, under the Act of March 2, 1883, made any money, and some of them suffered serious loss; and this statement applies equally to the manufacturers who made the steel for the pioneer ships,—at least one old and well established concern being wrecked by the difficulties encountered, while others were embarrassed.

The year 1884 was signalized by a Presidential campaign of unusual bitterness, and, notwithstanding the cordiality with which all parties had joined hands in the inception of the new navy, the first session of the Forty-eighth Congress developed what for a time threatened to be at least a temporary hiatus. But wiser counsels at length prevailed, and, though no additions were made to the list of new ships authorized, sufficient appropriations were made to prevent stoppage of work on those already under contract.

The results of the year 1884 were chiefly interesting because they demonstrated, after much bitter debate and heated discussion, that

the cause of the new navy had acquired impetus sufficient to vanquish the party passions of even so violent a Presidential campaign as that which marked that year. That campaign over, the Forty-eighth Congress, at its second session, took up with zeal the promotion of the new navy, and the act approved March 3, 1885, authorized four additional vessels, toward the construction of which $1,895,000 was appropriated with practical unanimity. The Act of March 3, 1885, marked an epoch in the history of the new navy. Prior to that time, the legislative practice had been to require separate enactment to authorize the construction of new vessels for the navy. In this case the authorization appeared in the body of the regular Naval Appropriation Bill, and that practice has been followed ever since. This innovation was debated in Committee of the Whole, and a point of order made to strike out the proposed authorization. The point of order was overruled by Hon. James B. McCreary, a Democratic member from Kentucky, with the approval of Speaker John G. Carlisle; Mr. McCreary being Chairman of the Committee of the Whole on the Naval Bill. Mr. McCreary ruled: 1st. That legislation in pursuance of any settled or established policy was germane in the annual appropriation bill which

dealt with that subject matter. 2d. That the increase of the navy was clearly a settled and established policy, to which all branches of the government were committed. 3d. That in view of that fact the authorization of additional vessels of war could not be considered new legislation in the meaning of the rules, but must be regarded as progressive legislation in a direction previously sanctioned by Congress; that therefore the authorization of new ships was germane to the regular naval appropriation bill for each year, and was in order.

It is hard to overestimate the value of this ruling to the interests of the new navy. Every one familiar with legislative processes knows the advantage which appertains to the "right of way" enjoyed by a regular appropriation bill as compared with the average chances of an independent measure. These advantages are so marked, that it is quite proper to say that Mr. McCreary's rule on this point was of greater importance than any other single incident in the legislative history of naval reconstruction. In the Act of March 3, 1885, appeared another clause prohibiting the repair of any existing wooden vessel when the cost of such repair should exceed 20 per cent. upon the whole cost of such vessel entirely new. This clause was adopted upon the recommen-

dation of Secretary Chandler, made in the previous year; its obvious object being to render impossible the perpetuation of the old and obsolete wooden ships. Its effect soon became apparent in a rapid elimination of old wooden vessels from the navy, until by 1890 only sixteen of them remained on the active list, and nearly, if not quite, every one of these was then in her last commission. It is impossible to overestimate the salutary effects of this clause. 1st. It "cleared the decks" of a lot of obsolete lumber. 2d. It stimulated public opinion to demand prompt production of new and modern ships to take the places of the old and obsolete. 3d. It put an end to a policy of makeshifts which was always extravagant, often wasteful, and sometimes corrupt.

The building of the four pioneer ships involved several new departures. The Congress that authorized their construction and made an appropriation toward it, also made provision for creating what was termed a second "Naval Advisory Board," which was to have charge of the details of their building. By this expedient Congress hoped to avert the evils of the Bureau system on the one hand, and to limit the one-man power of the Secretary on the other. This board consisted of five members, three naval officers and two civilians, to

be selected by the Secretary of the Navy. Of the two civilians, one was a ship-builder, the other a mechanical engineer. The ship-builder was Henry Steers. This gentleman was a nephew of George Steers, a somewhat celebrated naval architect in his time, whose principal achievement was the design of the yacht "America," which won the cup which the English have struggled ever since to recapture. The famous steam-frigate "Niagara," built a short time before the war, though constructed in a navy-yard, was designed by Henry Steers. During the paralysis of American ship-building which followed the Civil War, Mr. Steers became discouraged at the outlook and, having a considerable fortune, went into the banking business.

The other civilian member, the mechanical engineer, was Miers Coryell, of New York. This gentleman was connected in his professional capacity with the Cromwell Line of steamships plying between New York and New Orleans. He had shortly before the time under consideration designed an engine for the "Louisiana" of that line, which Mr. Roach built, involving an entirely new departure in sea-going engine construction. Perhaps the most concise way to describe this engine would be to say that it represented an effort to intro-

duce the walking-beam of a side-wheel river steamboat into the engine compartment of a screw steamship. The advantage claimed for it was that it permitted the use of vertical cylinders within a deck-height not sufficient to admit the regular type of vertical inverted cylinders. This it undoubtedly did; but there its merit stopped. For the rest it was cumbrous, complicated, and of weight exceedingly disproportionate to its power. This unspeakable device Mr. Coryell offered to the Advisory Board, and, to the speechless amazement of the engineering world, it was adopted as the propelling machinery of the most important ship then authorized for the navy. It is worthy of remark here that these beam-engines were subsequently taken out of the "Chicago," and a pair of vertical inverted or slightly inclined engines of the usual type substituted. And it might also be observed that this work, with some alterations in the hull, was done in the New York Navy-Yard at a cost of $1,300,000 as against an original contract price of $889,000 for the whole ship new; or, in other words, the cost of re-engining and overhauling the "Chicago" in a navy-yard was 40 per cent. more than the first cost of the new ship under contract in a private shipyard!

The Navy Bureaus were not slow to discern what the creation of the Advisory Board meant for them. At first they tried to defeat it. Finding that impossible, two of the Bureau chiefs besought the Naval Committees of the Senate and House to provide that at least one of the four ships be built in a navy-yard. No member of the Senate committee favored this proposition, and but two members of the House committee, both of whom, it is hardly necessary to say, represented navy-yard districts and danced to the music of labor agitators. Thus, at the inception of the new navy the navy-yard snake was "scotched," if not killed.

When the contracts and specifications were drawn up in form, two facts became evident: One was that the knowledge of the new conditions of naval construction possessed by the authorities of the navy itself was altogether academic; and the other was that neither naval authorities nor civilians interested had any adequate idea of what the requirement of the law in regard to material actually signified. The law said that the ships must be built of "steel, of domestic manufacture, having a tensile strength of 60,000 pounds to the square inch, and an elongation of 25 per cent. in eight inches."

Verbally, this was the English Admiralty standard for mild steel plates and shapes. But the English had an elastic system of inspection which left much to be determined by the judgment and knowledge of the inspector. The system adopted by our earlier inspectors of material was rigid as a rock and inelastic as cast-iron. The letter of the law, not the spirit of it, was their guide. These requirements and the mode of enforcing them would have been drastic had the mild-steel industry been in a flourishing condition. But as a matter of fact it had not been developed at all in this country; so they were formulating crucial requirements for the product of an industry which did not exist. The production of mild steel, or at least its use in naval construction, was still in the experimental stage then, even in England, its native home. The "Iris" and "Mercury," the first all-steel ships built in England, had not been in commission more than two years, when the requirements for our new ships were formulated by the naval authorities and embodied in an Act of Congress.

Bessemer steel was produced in large quantities here at the time for making rails and tank-plates. But Bessemer could not stand the navy tests. Nothing but open-hearth steel could do it, and at the time when bids were

asked for the first four ships there was not an open-hearth mill in the country that could make the ingots required for the plates and shapes of the sizes and qualities demanded. Still, American steel-makers were found willing to undertake the task, though the sequel soon proved that their conceptions of what confronted them were quite vague. When one surveys the open-hearth steel industry as it exists in the United States to-day (1901), largely exceeding that of Great Britain, and greater than that of all the rest of the world, exclusive of the United Kingdom, put together, it seems impossible to realize that it is all the growth of a score of years. As late as 1887 there was no forging-mill in this country that could forge a three-throw crank-shaft in one piece, and the "Baltimore's" crank-shafts of that description had to be imported from Whitworth's works in England.

Such were the conditions which confronted the ship-builders who made estimates and offered bids for the construction of the four pioneer steel ships of the new navy. When the bids were opened early in July, 1883, it became apparent that the views of bidders as to the character of the task they proposed to undertake were quite divergent. To avoid prolixity, we will deal only with the "Chi-

cago," which was, in fact, the representative ship. For that vessel there were but two bidders worth considering,—Mr. Cramp and Mr. Roach. Mr. Roach bid $889,000 for the hull and machinery. Mr. Cramp bid a little over $1,000,000, or about 14 per cent. in excess of his competitor. As the sequel proved, Mr. Cramp, conservative as his bid was, or as it appeared to be, underwent no misfortune in failing to get the "Chicago" at $1,025,000. Whether Mr. Cramp could have been more successful than Mr. Roach was in creating the new openhearth steel industry required to produce the material demanded by the law and the specifications need not be discussed. It may, however, be said that the excess of his bid over that of Mr. Roach was due wholly to his misgivings on this point; because on all other points involved, such as experience, skill, and effciency of organization, he had some advantage.

Mr. Roach got all the ships. The contracts were signed July 26, 1883. The keel of the "Chicago" was laid December 5, 1883; she was launched December 5, 1885, only fifty-two days before the contract date for completion, which was January 26, 1886. Meantime the first of the ships, the despatch-boat "Dolphin," had ben completed, put on trial, and had failed

to meet the requirements of the law. Here the evils of the inflexible, inelastic, or "cast-iron" form of contract became instantly evident. The Navy Department could not accept the ship under those conditions without violating the law. Mr. Roach thereupon threw up his hands, and the government, as provided in the contract, had to take possession of the ships as they stood in his shipyard and complete them with its own resources, at the risk and expense of Mr. Roach and his bondsmen. This action on his part is hard to understand or explain. He was perfectly solvent. Although, as the law and the contract stood, the Navy Department could not accept the "Dolphin," in view of her deficiency in performance, Congress was soon to assemble, and Secretary Whitney was ready to ask for an amendment or modification of the law which would enable him to accept the ship with an equitable penalty for her deficiency, which, by the way, was not great. It was said at the time that Mr. Roach acted upon the advice of certain political friends holding high rank; that a certain group of Republican politicians believed that their party needed a martyr just at that juncture, and they thought Mr. Roach would make a good one. Be this as it may, the government finished all the ships in the Roach yard,

and the "Chicago," contracted for July 26, 1883, was ready for her first commission the middle of April, 1889,—five years and nearly nine months building. We have dwelt with some prolixity on this branch of the subject for two reasons: first, because it was the beginning of the most important epoch in our naval history; and, second, because the errors, miscalculations, and consequent disasters it developed became themselves of very great value as object lessons for guidance or warning in subsequent transactions.

When Mr. Whitney became Secretary in March, 1885, he found ready to his hand authorization for four more ships, the designs of which had been partially worked out by the Bureaus during the previous winter. He, however, proceeded slowly; so deliberately, that the contract for the first of the four ships built under the authorization of March 3, 1885, and August 3, 1886, was not signed until December 17, 1886, a year and nine months after he assumed the office. This delay was due to a variety of causes, the most important of which are interestingly and instructively described by Mr. Cramp himself in an account of his personal connection with the transactions. It may be premised that when Mr. Whitney became Secretary of the Navy, he very soon

sought to avail himself of Mr. Cramp's experience, professional ability, and practical knowledge. Mr. Cramp responded in the same spirit of frankness and candor as that in which the Secretary invited him. There was no mincing of matters in any direction. Mr. Cramp hewed to the line on all the abuses and shortcomings of the old régime, and he also pointed out methods by which they could be overcome or, at least, compelled to get out of the way. Mr. Whitney was a thorough business man and an able lawyer. Far removed both by character and by fortune from any possible temptation, Mr. Whitney's sole object in taking the navy portfolio was to promote the public welfare, and thereby add lustre to his name.

But let Mr. Cramp tell his own story in his own way.

THE BEGINNING OF THE NEW NAVY.

"The practical beginning of the new navy occurred under the Administration of Mr. Chandler, and while he was Secretary of the Navy the 'Chicago,' 'Boston,' 'Atlanta,' and 'Dolphin' were constructed.

"The hulls of these vessels had been designed by the Advisory Board, and were about equal to any vessels constructed abroad at that time so far, I might say, as the models and general designs were concerned. Their outfit and guns were not fairly up to the prevailing practice

abroad, and their engines were very inefficient and commonplace. They were not designed by the board, but were principally the designs of the contractor. The 'Chicago' had engines of quite a fantastic design, suggested by one of the members in the board. The models and designs of the hulls, as compared with what had preceded them in the Navy Department after the end of the Civil War, were great achievements over the ridiculous specimens of the ship-building art that we were loaded with during that time. They were the production principally of Messrs. Steers and Fernald, assisted by Mr. Bowles, and were up to most of the requirements of the time.

"When the vessels were tried under the following Administration, that is, during the Secretaryship of Mr. Whitney, it was found that the power of the engines and the consequent speed developed were not up to the requirements of the law, although it might be said that they were up to the requirements of the contract.

"There was some considerable delay on the part of the Secretary, Mr. Whitney, in receiving the ships from the contractors on that particular account, a decision having been made by the Attorney-General that vessels contracted for and subsequently not coming up to the requirements and not in full accordance with the law were worthless, and would not be accepted.

"A violent uproar pervaded the entire country at that time on account of what they called the hesitating attitude of Mr. Whitney.

"The political administration of the government having changed, it was asserted that it was on account of the politics of the contractor that the vessels had not been accepted. Among the people who argued thus, all considerations of contract requirements of law were entirely ignored, and Mr. Whitney received untold denunciations

from these sources; but he was one of those men whom adverse criticisms as to what he had done never disturb in the slightest degree.

"Mr. Whitney finally accepted the vessels conditionally, after more or less contention which consumed some little time. But no more unfair denunciation or criticism of the actions and efforts of any man ever occurred than fell to his lot at that time.

"The second lot of vessels was given out by Mr. Whitney, who succeeded Mr. Chandler. Two of these vessels were built on plans provided by Mr. Whitney, and two were on modified plans of Mr. Chandler.

"In compliance with the provisions of the act which authorized the 'Secretary to prepare drawings,' Mr. Whitney purchased from Armstrong the drawings that had been prepared for the Spanish government, and the drawings of the 'Naniwa Khan,' which ship they had built for Japan. These two vessels became the 'Baltimore' and 'Charleston.' Cruiser No. 1 of Mr. Chandler's plans was not given out; as the bids were above the limitation price, the smaller cruiser was given out under modified conditions. This vessel became the 'Yorktown.'

"Before the advertisement was printed, Mr. Whitney invited all of the expectant bidders to examine the plans and specifications which he had purchased, and without exception all recorded their indorsement, and some in extravagant terms. After Mr. Whitney's retirement, the contractor who had indorsed them in the most extravagant manner was the first and only one to find fault.

"We bid on all the vessels and in accordance with the conditions of the advertisement with the exception of that of the 'Yorktown.' On that vessel we bid on the government designs, and designs of our own which embodied a

proposition to install the first triple-expansion engines in the navy. Our bid for the 'Newark' being higher than the government allowance, we did not get her. As I said before, she was not awarded.

"When it was found that Mr. Whitney had purchased abroad the drawings that I have already referred to,—the drawings of the vessels that ultimately came to be the 'Baltimore' and 'Charleston,'—he was fiercely assailed by certain parties in the Navy Department, while certain others indorsed his action; but the Bureau of Construction and Repair and the Bureau of Steam Engineering were conspicuous in their opposition. The most conspicuous in support of the Secretary was Commodore Walker. We received our share of adverse criticism because we had indorsed the steps he had taken.

"The design of the 'Baltimore' and the 'Charleston' represented the best types of vessels that were constructed up to that time. They were far in advance of any other war-ships of that period, and in fact they really formed the basis of future constructions in the world's navies.

"It was more by good luck than by good management that Mr. Whitney secured those particular drawings which proved to be of such superior character. They were offered to our Naval Attaché, who happened to be abroad in England at that time, by the Armstrong Company. They had designed the two vessels which subsequently became the 'Baltimore' and 'Charleston' of our navy. The design of the 'Baltimore' was made in competition with Thompson for the Spanish government. For certain reasons, which I need not mention here, the designs of Thompson were accepted and the contract for the construction of the ship was awarded to them. She was known as the 'Reina Regente.' It was at this point that the Armstrongs presented their rejected drawing and the drawings for the

'Naniwa Khan' for sale to our Naval Attaché there. They had already built two vessels like the 'Naniwa Khan' for the Japanese navy. These vessels were looked upon by the experts of the naval world as being the two best specimens of their type that had ever been built up to that time.

"At the time the sale was made, the Armstrongs, knowing nothing of the capabilities of this country and having, like most British ship-builders and many Americans at that time, a very mean and very poor opinion of every ship-builder in this country, they suggested that, in awarding the contract, a condition should be inserted providing for the payment of superintendents whom they should send over from their works to superintend the building, and designing of the engines, and operating them after their completion. Considering what to them appeared a barbarian incapacity on our part, they were loath to risk their reputation without protection.

"We accepted the condition at the time, anxious to get the contracts, feeling sure that it would never be needed, and that we could prevail upon Mr. Whitney and the naval people as to the impropriety of it.

"After the contract was awarded and the work was started, Mr. Whitney concluded that, notwithstanding the provision was there, he would never use it, and never require it of us.

"In fact, we made a great many improvements in the boilers of the 'Baltimore,' and some improvements in the engines. These improvements in the boilers of the 'Baltimore' formed the basis and the standard of construction of all the Scotch boilers that have been built for the navy since that time.

"At the beginning of our work on these ships we did not get much co-operation on the part of some of the

Bureaus, in view of the foreign character of most of the work, and in view, too, of the fact that some of it was of our own, both being equally obnoxious, as they originated outside of the Bureaus. We met with a great deal of opposition at the beginning in getting up the specifications and plans.

"Certain subsequent changes in the *personnel* that were made in the Bureau of Steam Engineering—Mr. Melville having been placed at the head of it—modified the situation, and he joined the Secretary in his efforts with his usual vigor. A part of the trouble I refer to in getting a start on the work was owing to lack of experience and knowledge of contract and specification requirements which were placed in the Law Department of the navy for the first time.

"The Law Department of the navy at that time was beginning to make a show, and to them, under some mistake, was delegated the getting up of the contracts and specifications. It was here where my trouble commenced. The Law Department endeavored to provide for everything that could possibly occur, or everything that they thought would occur, and for many matters that could not be considered at all; and the specifications soon began to assume enormous proportions, being filled with impossible requirements.

"I got over most of these difficulties and minor details which they intended to lug into the contract by having introduced at the termination of certain paragraphs of the specifications, where explanations were unsatisfactory, misleading, and inadequate, a clause using the words: 'As the Department may determine.'

"My previous experience with the Navy Department and naval officials generally led me to believe that I could always make out my case when it was right.

"At the beginning of the work, Mr. Whitney notified us that he considered himself and all the naval officials as partners and associates of the contractor, each mutually interested and determined to get the best vessel they could for the navy. He considered that the government ought to co-operate with the contractors, and that the contractors should in turn co-operate with the government; that the inspector was not an enemy, and never once considered him so. He considered it was his duty to afford all encouragement possible in aiding the contractors to carry out the plans. During the close of a conversation which I had with Mr. Whitney at one time during that period, he said to me: 'I want you to inform me of what you see going wrong, no matter where the fault originated; and I will hold you personally responsible in every case where you neglect to inform me whenever anything is not going right or not being done right, whether it be your own fault or that of the government.'

"Coming back to the ships and referring to the purchasing of the drawings abroad: At the time that Mr. Whitney bought those drawings, it occurred to us that the triple-expansion engine which was being developed by Kirk was a marked advance over the plain compound of Elder; and I suggested to Mr. Whitney the propriety of buying plans of triple-expansion engines from us for the smaller ship which afterward was the 'Yorktown.' Of course this was before the ships were given out. He told us to go ahead. We went to work and made the drawings, which we thought were much in advance of anything of that kind in existence, and we fully expected that they would be bought by Mr. Whitney, as he had purchased the foreign drawings. When the drawings were finished, I took them down to Washington and showed them to him. He was at this time so disgusted with and

tired of the great uproar that had been made about purchasing drawings abroad, that he did not say much about it. He did not decline, however, to buy them; but, finding that he was not enthusiastic, I accepted promptly the situation, and simply exhibited them to him as something we had gotten up. I then returned home and threw them aside, and prepared for the coming opening of the bids which had been advertised for in the papers. The day before the bids were to be opened, I suddenly conceived the idea of giving the triple-expansion plans another chance by making an alternative bid on the 'Yorktown,' embodying engines of the triple-expansion type. So I rushed back to Philadelphia, got the drawings that we had previously prepared, and returned to Washington in time to put them in with our other bid for the 'Yorktown.' As we were responsible for the horse-power, weight, etc., we felt that we could get it a great deal better, and more satisfactory results all around, with triple-expansion engines than with uncertain and unknown performance of the Bureau drawings. Our bid being lowest on triple-expansion engines, being the only one, the contract was awarded to us.

"The success of these engines in the 'Yorktown' was of a highly marked character, and it emboldened us to introduce them in our bids for the new lot of construction that had been advertised for.

"It was at this time the *New York Herald* published in large type a paper of mine on the triple-expansion engine, and Commodore Walker had it printed in the Reports of the Information Bureau. Walker was always in the front when a good thing was to be promoted, and was conspicuous in his co-operation with Mr. Whitney.

"When the ships that followed the 'Baltimore' were given out, we secured the contracts for the construction of

the 'Philadelphia' and 'Newark.' We bid on the 'Newark' a second time. A great deal of unpleasant feeling was manifested on the part of the Bureau of Construction when we failed to bid within the limitation price at the time she was first advertised. We introduced in her, however, the triple-expansion engine in place of the Department's. We also bid on 'Philadelphia' with hull duplicate of the 'Baltimore,' with triple-expansion engines of the same type as the 'Yorktown.'

"What ultimately became the 'San Francisco' was given to Mr. Scott, who bid on the basis of 'Baltimore's' plans of hull with the 'Baltimore's' engines. After the contract was awarded to him, he agreed to substitute the 'Newark's' hull plans in place of the 'Baltimore' type with a design of engine that the Bureau of Steam Engineering had made at our shipyard by some of their officers who were on duty there and certain of our draughtsmen,—a type of engine that they considered to be an improvement over the 'Baltimore's' engines. The Department granted this substitution.

"The Bureaus that had denounced Mr. Whitney for buying foreign drawings had been spending money very lavishly for some years in *securing plans abroad.* The Bureau of Steam Engineering and the Bureau of Construction were spending about $100,000 a year in the purchase of drawings.

"The hull of the 'Yorktown,' which was designed by the Bureau, was based on the design of the 'Archer' class.

"The 'Newark,' which was also designed by the Bureau at that time, was based on the design of the 'Mersey' class as to specifications and general construction, while the model was not of that class.

"The Bureau of Engineering, which had been laboring for some years with a view to a consolidation of all of

BATTLESHIP RETVIZAN—RUSSIAN

the constructive departments of the navy,—hulls, engines, guns,—under their Bureau, bought abroad entire plans of ships, hulls, and engines combined. I saw a complete set of plans and drawings of the 'Polyphemus,' which was designed as a sort of ram by the British government, and also the two vessels 'Warspite' and 'Impérieuse,' rather of a fantastic design, which the British government was building. These vessels were somewhat of a departure from previous vessels constructed in the British navy and were very crude. They were designed by some one in England who was not up to the capabilities of his fellow-constructors there. They were not duplicated. They are the poorest specimens of ships in the British navy.

"Mr. Whitney was exceedingly fortunate in the officer whom he found at the head of the most important Bureau. This was Commodore John G. Walker, then Chief of the Bureau of Navigation, and unquestionably the ablest and most forceful man of his time in the navy. American naval officers, as a rule, are able men in the professional sense; but Walker, while equal to the very best and superior to most of them in that regard, possesesd an additional fund of tact, equipment, and energy in purely administrative directions seldom equalled and never surpassed in the history of our navy. He had enjoyed, also, considerable experience in civic responsibility, having been for a considerable period identified with the management of an important railway corporation prior to his appointment as Chief of the Bureau in 1881. His term of four years was about to expire when Mr. Whitney assumed office, but at the instance of the latter he was immediately reappointed, and served through the entire term until 1889. Commodore Walker was exactly the man for the place, which was that of chief adviser to the Secretary. To a

perfect acquaintance with the *personnel* of the service, he joined a freedom from narrow predilections and selfish aims seldom found in any veteran regular officer of any branch, and his sense of the material needs of the navy was broad, keen, and practical. Moreover, in mental character and manly temperament he was congenial to Mr. Whitney. For these reasons, and imbued with a common purpose, Commodore Walker and the Secretary coalesced from the first day of their association, and remained in the most perfect accord throughout the four most important years in the history of the new navy. On some occasions it happened that Walker sustained the Secretary and helped him carry out most important reforms and policies of progress against powerful opposition in the navy itself and in the Department.

"Commodore Walker's influence among Senators and Representatives in Congress, built up during his first four years in the Bureau, was superior to that of any other officer, and occasionally it proved equal to that of a considerable majority of them combined. His powers were uniformly exerted in behalf of the readiest and most practical methods of increasing the navy in number, excellence, and force of its ships and in organization and training of its *personnel*. Against all efforts to perpetuate the obsolete, cumbrous, and abnormal navy-yard system of construction he set his face with all the strength and resolution he possessed. For detailed discussion of the questions involved in this phase of the subject, neither the limitations of space nor the patience of scientific readers offer opportunity. Suffice it to say, that the antique, red-tape-ridden and muddle-brained policy of trying to build new ships of the modern type under military methods was in the main abandoned.

"Commodore Walker also ably supported Mr. Whit-

ney's policy of purchasing modern designs and plans of hulls and machinery abroad, a policy which a large and influential group of naval officers vehemently opposed. On the whole, it is not too much to say that, in the all-round importance of his usefulness to the new navy, Commodore Walker fairly divided honors with Mr. Whitney himself.

"That Walker's all-round ability and energy were understood and appreciated by others besides Secretary Whitney is abundantly attested by the fact that upon his retirement in 1897, at the age of sixty-two, he was appointed chairman or president of the Isthmian Canal Commission, which he still holds at this writing (1903), in his seventieth year. Taking his career altogether from graduation at the Naval Academy in 1856; then through the Civil War, in which he played a distinguished part; then for some time in the civic pursuits already mentioned; then as Chief of Bureau and principal adviser to the Secretary for eight years; then as Admiral in command of the 'White Squadron'; and, finally, as president of the Canal Commission, it is safe to say that few officers in our navy have done more important public service than John G. Walker."

The most important matter adjusted in the conferences of Mr. Cramp with Mr. Whitney was the arrangement of the form of contract so that it might be, within a narrow margin, flexible or elastic. The operation of other contracts had clearly shown the need of such modification, and a solution was reached without difficulty, though not without much deliberation.

The matter under immediate consideration was the form of contract for the "Baltimore." The guarantee to be required was that her engines should develop a mean of 9000 collective indicated horse-power for four consecutive hours, a lower or minimum limit being also prescribed. They had before them the form of contract for the Roach ships.

Mr. Cramp remarked that the guarantee for the "Baltimore" was 9000 indicated horse power.

"Suppose, Mr. Secretary," he said, "that we should use that form of contract, and the engines of the 'Baltimore' should develop only 8999 indicated horse-power, what could you do?"

"Well, Mr. Cramp, under this form of contract, construed according to law, I could not accept her. There ought to be a way of averting such a possibility. What can you suggest?"

Mr. Cramp then proposed to apply to our naval contracts the principle often recognized in agreements for construction of merchant steamships and also in the naval contracts of foreign governments, namely, a sliding scale of penalties for deficiency in performance, with a minimum limit; and, in case the ship should prove unable to reach the minimum limit after

a fair number of trials, the owner (if a merchant vessel) or the government (if a naval ship) might at will either reject her altogether or accept her under a supplemental agreement. Mr. Cramp also explained the usual basis upon which penalties for deficiency were computed and imposed in our own merchant practice and in foreign navies.

The Secretary assented to this suggestion, and pronounced it the only business-like plan for solution of the difficulty he had heard. But he said that, in order to make the arrangement perfectly equitable, there should be a premium for excess over and above guaranteed performance, corresponding to or commensurate with the penalty for deficiency.

These discussions led to the adoption of what became known as the premium system. Some time afterward, when Mr. Whitney was before the Naval Committee, the subject came up, and one member referred to it as "a bonus to contractors."

"If you use the word 'bonus' in the sense of a gift," said the Secretary, "it is a misapprehension. It is part of an equitable transaction. Performance is a prime element of value in a ship-of-war. We stipulate in our contracts for a specific performance. We consider the guaranteed performance as repre-

senting the normal value of the ship. If upon trial the performance falls below the normal, it reduces the value of the ship to that extent, and we meet it with proportionate penalties deducted from the contract price. But if upon trial the performance exceeds the normal, the value of the ship is increased, and we propose to meet such cases with premium proportionate to the excess of guaranteed performance. In either case we simply pay for as good a ship as we get, be it above or below the normal. It is a poor rule that won't work both ways."

Mr. Whitney's terse observations embodied the whole logic of the penalty and premium system, and his argument was so conclusive that no further discussion seemed to be desired. The system remained in effect nearly ten years, and was applied to every vessel built for the new navy up to and including the "Iowa" and "Brooklyn." Every ship built by Mr. Cramp earned a premium for excess of either indicated horse-power or speed. None of his ships exhibited deficiency. The list is rather interesting, because it exhibits more graphically than any other method could do the actual extent to which the contract requirement was exceeded in each case

"Yorktown" (horse-power)	$39,825.00
"Baltimore" (horse-power)	106,441.00
"Newark" (horse-power)	36,857.00
"Philadelphia" (speed)	100,000.00
"New York" (speed)	200,000.00
"Columbia" (speed)	300,000.00
"Minneapolis" (speed)	414,600.00
"Indiana" (speed)	50,000.00
"Massachusetts" (speed)	100,000.00
"Iowa" (speed)	217,420.00
"Brooklyn" (speed)	350,000.00
	$1,915,143.00

When the administration of Mr. Whitney ended in March, 1889, he left over to his successor the most important work in the way of new departure yet attempted. Of his successor, General B. F. Tracy, of New York, Mr. Cramp, speaking of the man and the task before him, says:

"Secretary Tracy entered the Navy Department under very favorable auspices. He was himself free from entanglements, political or personal. His previous public life, aside from service as a colonel and brigadier-general in the Civil War, had been confined to legal and judicial positions, his highest post having been that of Justice of the New York Court of Appeals, the Court of last resort. To the affairs of the Navy Department in general he applied the judicial habits formed on the Bench. In technical matters, he enjoyed at the outset of his administration the continuing services of Commodore—now

become Rear-Admiral—Walker, whose term extended till December, 1889; and who, by the way, had the honor, after eight years of service as Chief of Bureau, to command the first American squadron of modern war-ships known to history as 'the White Squadron.'

"With regard to the task of rebuilding the navy, which was then, and still is, the chief responsibility of a Secretary, Mr. Tracy had but to carry on a programme already well begun. He was not, however, content with following simply the lines laid out before him. He at once proceeded to lengthen them and to widen their scope. Under his administration was begun and carried out the 'battleship and armored cruiser programme' which gave to the navy the fleet that made our success in the Spanish War so swift and so easy.

"The distinguishing traits of Tracy's administration were the unbroken co-operation between the executive and legislative branches of the government in everything pertaining to the new navy, and the remarkable progress made in size, power, speed, and other prime qualities of war-ships, together with the almost incredible development of all contributory industries. In this connection should also be mentioned the constant and powerful support which President Harrison gave to the Secretary of the Navy in every possible manner, from first to last.

"In his methods of considering propositions laid before him, Mr. Tracy was always deliberate and cautious; but in executing a programme once resolved upon, he was equally prompt and peremptory. He never determined to begin anything until he could foresee the end of it, and when he had reached a conclusion on that basis he was wont to push practical operations with untiring energy. In some respects, when giving preliminary con-

sideration to subjects, he may have been less self-reliant or more disposed to feel the influence of his military subordinates than Mr. Whitney was; but in energy of execution he had no superior. As a general consequence, Mr. Tracy's four years in the Navy Department made a history that compares favorably with that of any predecessor from the foundation of the Department itself in 1797 to his own time.

"One of the first and most important matters that came before Secretary Tracy was the design of the armored cruiser 'New York,' the appropriation for its construction having been one of the last acts of the Congress that went out with Mr. Whitney. This ship was intended to be an echo to the 'Blake' and 'Blenheim' type of protected cruisers, and they were the largest heretofore constructed. The question was asked by the Secretary of the head of one of the Bureaus, during the discussion of the details of the ship, if there could not be an improvement in the salient features of the design over the 'Blake,' as merely copying her was obnoxious to him. He had heard of the 'Dupuy de Lome,' the first of the armored cruisers, and he conceived the idea of adding vertical armor on the sides of the ship in addition to the sloping armor of the protected deck as an additional protection, and of sufficient importance to warrant its adoption in the new design. He argued that no projectile could penetrate the outer plates and strike the sloping plate at the same angle in both, etc.

"Strong objections were urged by the head of the Bureau who had been consulted about it, and the legend of weights of the 'Blake' as published and the distribution of them in the 'Blake' were shown with the assertion that nothing could be done. The Secretary became more persistent as the opposition increased, and the wires be-

tween the Department and the British Admiralty became hot from the number of messages that passed as to the 'Blake' and 'Blenheim.'

"While the Secretary was perplexed with the opposition of officers who should have aided rather than opposed him, we happened to meet, and he asked if I could duplicate the 'Blake' and her performance if side armor of moderate thickness were added, and also asked my views of the 'Dupuy de Lome' and other ships of the same kind.

"I promptly stated that I could do it, and explained the idea of 'Dupuy de Lome,' also giving him the names of three other armored cruisers the French had under way. I went into the Secretary's room at 3 P.M. and discussed the whole subject with him till 8 P.M.; then left, and promised to return promptly with additional information.

"At the next interview I furnished the Secretary with a complete detail of what would be required to make an armored cruiser on the 'Blake's' dimensions and performance, and stated that I would like to bid in Class II on an alternative design with side armor.

"The Secretary handed my details and allotment of weights to the proper officer, and the Department proceeded to get up the plans and specifications. Frequent interviews with the Secretary occurred as the work progressed, and I felt sure that under Class II, permitting alternative designs, the contract would be awarded. Before the time for awarding the contract had arrived, I found that the plans were being developed under the conditions that I had given the Secretary; but when the plans were exhibited before bids were sent in, it transpired that the boilers had been placed three abreast in

the government plans, bringing them within a few feet of the side of the ship.

"I then designed a plan for arranging the six boilers in pairs, making the coal-bunkers on the sides of the ship. This arrangement of coal-bunkers facilitated the prompt coaling of the ship and the handling of it. It also permitted a liberal amount of 'coal protection' for the boilers and engines, which was considered of important value at that time, and, what was of more weight than any other consideration, the introduction of two longitudinal bulkheads that extended the entire length of the engine and boiler spaces on each side of the ship. With three boilers abreast, the ship was liable to be sunk at any time by a collision with a coal-barge or passing schooner; any penetration of the side abreast of boiler, besides resulting in a speedy foundering, would certainly unship the side boiler, adding thereby an explosion to the other damage.

"With the boilers in pairs, it would be necessary for a ramming vessel to penetrate the side and two bulkheads and enter ten feet to do any damage, so the chances of being destroyed by ramming would be reduced to a minimum. I also lengthened the vessel over the Department's plan, but kept all the conditions of specifications intact, except as to dimensions.

"After the bids were opened, it was found that ours was the lowest in Class II, and lower than any other bid, taking the competition as a whole. The Secretary then called a conference, at which all the bidders and the Chief Constructor were present, and, after thorough discussion of all the points involved, awarded the contract to the Cramp Company under the bid in Class II on the modified plan I had suggested and offered as to boiler arrangement and other details conformable to it.

"The ship was named the 'New York,' and on trial trip she largely exceeded her contract speed and requirements of coal endurance and in all other respects; while the 'Blake' on trial was a failure; her engines had to be practically rebuilt, and then did not come within the scope of reasonable competition.

"Mr. Tracy can fairly claim credit for the design of the 'New York,' and the project for the construction of the 'Indiana,' 'Massachusetts,' and the 'Oregon' class of battleships was also due to his foresight."

It is not within the scope of this Memoir to trace the progress of the new navy ship by ship, or even by naval programmes from year to year. For the purpose of this work, it suffices to say that, of the total number of battleships, armored cruisers, and first-class protected cruisers actually in service at this writing (1903), Mr. Cramp has built about a majority as against all other American ship-builders combined. There are ten battleships in commission, of which Mr. Cramp has built five; two armored cruisers, both built by him; ten protected cruisers of the first class, of which five hail from Cramps' shipyard: that is to say, a total of twenty-two vessels, all first-class in their respective types, of which Mr. Cramp has built twelve as against ten by all other American ship-builders put together, navy-yards included.

Of course, we exclude from this reckoning

BATTLESHIP RETVIZAN—DOCKING WITH SUBMARINE

the two show-ships built by Armstrong for a South American government and foolishly bought by our Navy Department in the paroxysmal flurry incident to the outbreak of the Spanish War. The main excuse for buying them was that, if we did not, Spain would. So be it. Better to have let Spain buy them, if they could not have strengthened her navy more than they did ours. At any rate, had Spain bought them, we might have captured or destroyed them, as we did nearly all her ships. They would probably have been worth capture or destruction, but they were never worth buying.

Since 1887, a period of sixteen years, Mr. Cramp has completed fifteen ships for the navy (including the "Vesuvius" and "Terror"), and is building three more at this writing. In every case these ships embody in plan and design more or less of his own knowledge, skill, and experience. In some cases the designs are altogether his own. In others the machinery is his, with important modifications of the Department's hull. In no case has he built a ship wholly upon the plans of the Department. While this has redounded to the benefit of the navy, it would be idle to say that it has been in the long run advantageous to Mr. Cramp. On the other hand, its tendency

has been otherwise: A certain class of naval officers have chosen to consider Mr. Cramp's constantly recurring propositions to modify and improve their designs as having the force and effect of criticisms, and, to say the least, they have not been grateful to him for his pains. On the contrary, no little jealousy and some resentment have been the results, and he has been made to feel their consequences more than once. The chief misfortune of this state of affairs is that it precludes the cordial co-operation which should exist between officers of the Navy Department and a contractor engaged in building naval vessels, and creates in its stead a sense of antagonism which tends to augment the difficulties of naval construction, which are great and perplexing enough at the best.

But Mr. Cramp has not concerned himself with the building of naval ships alone. He has delved into the problems presented by the uses to which the ships are put when completed. The results of his observations in this direction were embodied in an address to the Naval War College read before that institution, June 18, 1897, by invitation of the Commandant, a little less than a year before the Spanish War. The experience of that struggle, brief as it

was, and decided almost wholly by sea power, made this paper little short of prophetic.

Some extracts from it will serve to exhibit the trend of Mr. Cramp's thought in the direction of the practical uses and needs of ships-of-war after they leave the ship-builder's hands. Among other things he said:

"The accomplishment of the objects of sea-warfare will depend partly upon the character of the armaments and partly on the wisdom with which their operations are directed; nor can any one gainsay that the wisdom of direction will depend on the conversancy of officers with the nature and necessities of the material units of which the armaments are composed.

"These propositions being taken for granted, it becomes clear that there can be no effective system of teaching the art of naval warfare which does not embrace exhaustive study of and consequent close familiarity with the instruments by which the principles of the art are to be carried into force and effect.

"From this point of view it must be admitted that questions within the province of the naval architect and problems which he is best qualified to solve form an essential part of such a curriculum in its largest and most comprehensive aspects.

"The unvarying tendency of naval progress is to exalt the importance of the naval architect and to augment the value of the constructor as a factor in the sum-total of sea power.

"The naval armament of to-day is a mechanism. If we view it as a single ship, it is a mechanical unit whose warlike value depends on its excellence as a fighting ma-

chine. If we view it as a fleet, it is an assembly of mechanical units, the warlike value of which will depend alike on the excellence of each unit as a fighting machine, and on the adaptation of each unit to its consorts to produce the most symmetrical efficiency of the group as a whole.

"For this reason, the word seamanship, in the old-fashioned or conventional sense, has ceased to cover adequately the requirements of knowledge, skill, and aptness which the modern conditions of naval warfare impose upon the officer in command or subordinate.

"By this I mean not to depreciate seamanship pure and simple, but to point out that modern conditions require an enlargement of the meaning of the term and a broadening of its scope of function far beyond the exactions of any former period.

"In the old days there was no essential difference in ships except in size. Experience in a sloop-of-war qualified an officer to assume, at once and in full efficiency, equivalent duties in a frigate, a seventy-four, or a three-decker. Familiarity with one ship, irrespective of rate, was familiarity with all ships. Tactical lessons learned in manœuvring one fleet were alike applicable to the manœuvring of all fleets. Even the application of steam as a propulsive auxiliary in its earlier stages did not radically alter the old conditions. At all events, it did not practically erase them, as the present development has done.

"This growth of complexity and elaboration, and this almost infinite multiplication of parts and devices in modern ships, have entailed upon the naval architect and constructor demands and difficulties never dreamed of in the earlier days. The staff required to design and construct an 'Iowa' is multiplied in number, and the com-

plexity of its organization augmented, as compared with that required for the design and construction of the 'New Ironsides,' almost infinitely.

"Similar conditions apply to command and management; so that, while the building of a modern battleship entails enormous work and responsibility on the naval architect, constructor, and staff, the effective use of her as a tool in the trade of war presents an equal variety and intricacy of problems to students of the art of naval warfare in this college.

"Such questions and such problems cannot be relegated to the category of details. Even if we consider the art of naval warfare in the aspects only of strategy and tactics, both will be affected for better or for worse by the behavior and performance of the units composing the force in operation. This being admitted, it follows that the behavior and performance of the units will be as the knowledge and capacity of captains and their staffs, and that no extent of skill and capacity in the admiral directing the whole can overcome or evade the consequences of incapacity and failure on the part of a captain commanding a part.

"As the speed of any fleet is that of its slowest ship, so will its manœuvring power be limited by the capacity of its poorest captain. As it might easily happen that the slowest or least handy ship and the poorest captain would be joined, the quality of the other ships and the ability of the other officers would go for nothing.

"In view of the complex character of the ships themselves, and the difficulty and danger of manœuvring them under the most favorable conditions, as pointed out, the experience of the first general action will demonstrate the necessity of having all the battleships in a fleet as nearly alike as possible in size, type, and capacity of per-

formance. Such provision would not equalize the personal factor of different commanding officers, but it would at least give them all an equal chance at the start.

"For this reason I have always considered it unwise to multiply types or to modify seriously those which the best judgment we are able to form approves.

"These considerations seem conclusive against multiplication of types, and in favor of adhering to one that plainly meets the requirements of our national situation and policy.

"The composition of a battleship fleet under such conditions would minimize the tactical dangers and difficulties referred to earlier, but they would still remain very great, and nothing can mitigate them except frequent and arduous drill in squadron of evolution, so that our captains may become familiar with their weapons before being called upon to use them in actual battle. There will be scant opportunity to drill a battleship squadron after the outbreak of war.

"In my judgment, it is hardly possible to overvalue the importance of homogeneity in fleet organizations, and I am sure that the very first and perhaps greatest lesson taught by an encounter between fleets of modern battleships will be the advantage of similarity of type and equality of performance in the units of action.

"To this element of the art of naval warfare, then, I would invite your most earnest and penetrating attention and study.

"Assuming this problem to be satisfactorily solved and the material of the fleet in the most effective possible condition, so far as relation of units to each other and to the sum-total is concerned, we have still left for consideration the difference between men, the lack of uniformity in *personnel*. Homogeneity of material may be

attained by adherence to a wise programme of design and construction; but homogeneity of *personnel*, in the sense of uniform capacity and efficiency among individuals, is beyond human art or science to produce, because the difference between men is the decree of a higher power. The existence of this college is itself a devout recognition of that great fact, because its whole objective is to mitigate or minify as much as possible this inherent human frailty, by exhausting the resources of training and study, of precept and example.

"I do not by any means argue that the commander of a ship should be a naval architect or constructor. But, having familiarized himself with the principles of that art which touch directly and immediately his function of handling his ship under sea conditions of common occurrence, and having gained sufficient knowledge of her traits, he should be able to form an instant and correct judgment as to her point of best behavior in any sea-way. It goes without saying that sea experience is the only school in which these problems can be worked out.

"Knowledge of that character cannot be acquired by study of the experience of others. Close and earnest attention to this course of, at best partial, information cannot serve as a substitute for experience of one's own. At most it can only provide a sound basis on which to take quick advantage of one's own experience, when confronted with an actual situation.

"This brings me to the proposition that the modern battleship, with all its complexities, weights, and peculiarities of design and model, entails upon commanding officers a new requirement which I can find no better terms to describe than 'battleship seamanship.' It is a development of the seafaring art which, as events have proved, is by no means yet mastered in the greatest and most act-

ively exercised navy of the world; therefore it would be too much to expect its mastery in navies of far less magnitude and, hence, less means for distribution of opportunities to gain experience.

"It therefore follows indisputably that navies of the lesser magnitude should constantly exhaust their means of enabling officers to gain sea experience by keeping all their large ships in active evolution all the time.

"Having thus viewed the modern battleship as a mechanical unit herself, we may profitably pass to brief consideration of the great number and variety of mechanisms composing her. In the strict professional or technical sense, these mechanisms concern mainly the engineer and the electrician. But as the foundation of all warlike efficiency in *personnel* is discipline, and as the foundation of all discipline is the inevitable principle of a single head, one commander, who is to all intents and purposes an absolute monarch, it should follow that 'the king can do no wrong.'

"I have already remarked that the captain need not be a naval architect or constructor to comprehend and be able to apply the group of principles of that art which touch his functions directly in managing his ship as a whole; likewise, I would say here that he need not be engineer or electrician in his relation to the numerous and diverse mechanisms whose proper operation and control are essential to the efficiency of his command.

"But, if he really commands, he must know enough about the instruments that do his work to know when they are doing it well and when not; to know whether his subordinates immediately in charge of the several devices are operating them properly or not; to know when defects exist and when they have been made good. If he does not know or cannot learn these things, he must

depend wholly on subordinates immediately in charge; and their reports will be law to him, or if not law, at least decisions from which he has no appeal. Manifestly such a situation is utterly incompatible with the independent and self-relying autocracy which is the essential and fundamental principle of naval command, without which discipline must sooner or later vanish into mere empty form or conventional myth. These facts, even more than any other considerations, argue for uniformity of type, previously touched upon, so that in learning the traits of one battleship the officer acquires experience and knowledge applicable at once to the discharge of his duties in another.

"The foregoing discussion is limited to matters affecting the unit of action, the single ship, and the captain. Passing to consideration of the unit of operation, the fleet and the admiral, we find another array of problems equally within the scope of this paper.

"Let us assume that the composition of the fleet has been made as nearly homogeneous as possible, by carrying out the principles previously stated for ships and their captains, and that the admiral finds himself in command of an ideal fleet as to material and *personnel.* Actual differences in efficiency among the several units of action will still remain, and it will become the first duty of the admiral to ascertain and locate these diversities with unerring judgment and unsparing perception. He should know to a nicety the personal equation of every captain and the effective individuality of every ship.

"Among the captains he should be able to differentiate the traits of relative quickness of perception, promptness of action, readiness of responsibility, and boldness of execution.

Among the most important services of Mr. Cramp to the new navy was his instrumentality in bringing about the system of classifying bids. Prior to 1885, whenever contract construction was to be done, the plans of the Department, pure and simple, were the standard. If any bidder proposed to deviate from them in any way,—no matter how palpable the improvement,—his bid would be held irregular and thrown out. The issue came on the machinery of the ships authorized by the Act of March 3, 1885. Of these four ships, the "Baltimore's" plans had been purchased abroad, hull and machinery, and were accepted practically without change. But the Department's design involved the then nearly, if not quite, obsolete compound engine for the other three, "Newark," "Yorktown," and "Petrel." Mr. Cramp, desiring to bid on the "Newark" and "Yorktown," was doubtful whether he could develop the indicated horse-power, which the form of contract required him to guarantee, with the Department's compound engines. He was, however, confident that he could do it with triple-expansion engines of his own design.

To overcome the difficulty, he suggested to Secretary Whitney that, in issuing the circular asking for proposals, a classification of bids be

provided for. This suggestion was at once adopted, and bids were authorized to be offered in three classes: Class I, the Department's plans pure and simple; Class II, the Department's plans modified by the bidder as to hull or machinery or both; and Class III, the bidder's plans wholly. This arrangement broke up the embargo of the Bureaus, and admitted the results of the study, experience, and skill of practical ship-builders. Some of the Bureaus fought the plan with all their energy, but the contest they made had no other result than to convince them that Mr. Whitney was the *de facto* as well as the *de jure* head of the Department,—a quite novel experience for them! Some time afterward Classes II and III were merged, so that all departures from the Department's plans, whether modifications of them or complete substitution of bidder's plans for them, were grouped under Class II, which has become the established practice in inviting proposals. Mr. Cramp's bids have usually been in Class II; involving in most cases more or less extensive modifications of the Department's plans, and in two cases, the "Philadelphia" and the "Maine," his own plans complete. The value of this new departure lay in the fact that it gave the Navy Department the benefit of all the progress of

the country in the ship-building art as actually practised by men who were building ships for a living, and emancipated it from the dominion of the cloister. It has become a part of the permanent policy of the government.

The history of Mr. Cramp's contributions to the new navy must, at this writing, be left an unfinished chapter. Having built and delivered to the government five first-class battleships, two first-rate armored cruisers, five first-class protected cruisers, together with a double-turreted monitor, a gunboat and a torpedo vessel, he is yet building three armored cruisers of the largest dimensions and most approved type. His contributions to the literature of the subject, ranging over a score of years, have been in their way of hardly less importance and interest than his achievements in producing its warlike material. Their full text, in all forms and through all channels,—hearings before committees, communications to the Navy Department and its Bureaus, newspaper interviews and magazine papers,—would, if reproduced in extenso, fill two volumes larger than this one. Suffice it to say here that there is no practical subject pertaining to naval art or science, from the design and construction of ships-of-war to their management in service, which he has not from time

CRUISER VARIAG—RUSSIAN

to time discussed as opportunity offered or occasion required. If he has at times shown a spirit approaching intolerance when dealing with invasions of his profession by inexperienced, untrained, or incapable men, it may be explained by the logic of a favorite quotation of his own, "Fools rush in where angels fear to tread!" Be this as it may, it is yet to be said that, if not always charitable in his criticisms and not always liberal in the standard of competency which he has set so high and maintained so vigorously, his professional motives have always been worthy and his efforts sincere and earnest. Whatever may be the future growth or achievements of the modern American navy, the name of Charles H. Cramp will ever be found indelibly stamped upon its historical origin and primary development. The ships he has built have won battles, gained campaigns, and vanquished the enemies of the country in war. They have held the lead in renewing the one-time waning naval prestige of our flag, and in restoring the sea power of the United States to its rightful rank among the nations.

CHAPTER V

Armstrong's—Russian War-ship Construction—Arrival of "Cimbria" at Bar Harbor—Visit of Wharton Barker to Shipyard—Visit of Captain Semetschkin and Commission to the Yard—Purchase of Ships—Newspaper Accounts—Captain Gore-Jones—Mr. Cramp's account of Operations—"Europe," "Asia," "Africa," and "Zabiaca"—Popoff and "Livadia"—Visit to Grand Duke Constantine—Anniversary Banquet in St. Petersburg of Survivors of "Cimbria" Expedition—Object of Visit to Russia—Mr. Dunn and Japan—Contract for "Kasagi"—Jubilee Session of Naval Architects in London—Visit to Russia—Correspondence with Russian Officials—Visit to Armstrong's—Japanese War-ship Construction—"Coming Sea Power"—Correspondence with Russian Official—Invited to Russia—Asked to bid for War-ships—Our Ministers abroad—Construction of "Retvizan" and "Variag"—"Maine"

THE old Latin poet Horace introduces his First Book of "Sermons or Satires" by addressing to his great patron, Mæcenas, the question:

"Qui fit, Mæcenas, ut nemo, quam sibi sortem
Seu ratio dederit, seu fors objecerit illa
Contentus vivat? laudet diversa sequentes?"

("How is it, Mæcenas, that no one lives content with the lot that endeavor has given to him or that fortune has

thrown in his way? but emulates those following other pursuits?")

Mr. Cramp reached the condition described by Horace early in the last decade of the nineteenth century. He had exhausted the opportunities of American ship-building, both for war and for commerce. A fleet, not only respectable in number but formidable in type and power,—a fleet embracing battleships, armored cruisers, and protected cruisers,—bore the impress of his art and heralded the distinction of his name. To this compact war-fleet he had added two ocean greyhounds, the first of their type built in the Western hemisphere. In prosecution of all this advancement, if we take the decade from 1885 to 1895, he had multiplied the area of the shipyard by two, and its capacity alike in number and size of steamships and their machinery more than three. In 1889, some people—and among them his own associates in the ownership of the yard—were afraid to undertake the armored cruiser "New York." Mr. Cramp met this obstruction with radical action, as was his wont in every emergency; and in four years from that time he had laid the keels of Atlantic greyhounds whose register tonnage was more than two thousand tons greater than the total displacement of the "New York."

Mr. Cramp had long been emulous, some Englishman might say envious, of the wonderful career of Sir William Armstrong and of his marvellous success in securing foreign contracts. On one occasion, returning from a visit to Elswick with a party from the British Institution of Naval Architects, of which he is a member, Mr. Cramp remarked that "Armstrong and his establishment had ceased to be ship-builders in the ordinary acceptation of the term and had become navy-builders. They do not trouble themselves," he said "with isolated ships; to all intents and purposes they undertake to build whole navies in bulk for ambitious maritime states in South America and Asia." At the time of the visit referred to, with exceptions hardly worth mention, the navies of Brazil, Argentine Republic, Chile, Japan, and China had been built, engined, armed, armored, munitioned, equipped, and outfitted at Elswick; and every ship was ready for battle when she finally sailed from Armstrong's works. In addition to this, Elswick had done a great deal of work for European states, having, at one time or another, contributed in some degree to every European navy, great or small, except those of France and Russia.

To a man of Mr. Cramp's untiring aspira-

tion and restless ambition, this was a spectacle not to be supinely endured. He therefore determined to see what could be done, and he selected what seemed to him the most promising directions of effort,—Russia and Japan. In dealing with the Russians he had initial advantages. The first was that Russia never had a war-ship, except the nondescript "Livadia," built in England, though she had been a liberal patron of English engine-builders. The second point of advantage was that in 1878–79 a considerable volume of work had been done by Cramp for the Russian navy, involving conversion of three large merchant steamships into auxiliary cruisers and the construction of one small cruiser.

The history of this interesting event, an event of international importance, is as follows:

In the early part of the year 1878 the North German Lloyd steamer "Cimbria" appeared at Bar Harbor with about sixty Russian officers and about eight hundred men. Their presence at that place created a great sensation. Visitors thronged there; and the officers were entertained at Bangor and also in the neighboring towns. The common sailors, however, who were allowed to go ashore about one hundred and fifty at a time, were cruelly dis-

appointed. They would go along the streets searching for vodka in vain. The Maine law, which was in full force, was something beyond their comprehension. "There is everything in the world here but vodka," they would say to one another, and even to their officers, when they returned to their ship from shore liberty.

Almost at the same moment when the "Cimbria" arrived in the waters of Maine, Mr. Wharton Barker visited Cramps' shipyard. The banking concern of Barker Brothers was at that time the representative of the Barings, who were the financial agents of Russia. Mr. Barker informed Mr. Cramp that he was delegated to arrange for the conversion and fitting out of a number of auxiliary cruisers for the Russian navy, and that he had selected the Cramp Company as the professional and mechanical instrumentality for that purpose. He arranged for a visit of a number of Russian officers to the office of the Cramp Company. These officers had come over independent of the "Cimbria," but arrived about the same time. They were the Committee or Board which had been appointed to decide on all questions that might arise in connection with the naval project mentioned. The head of this Board was Captain Semetschkin, Chief of Staff of the Grand Duke Constantine, who was

then General Admiral of the Navy. Besides Captain Semetschkin, the Board consisted of Captain Grippenburg, Captain Avalan, Captain Alexeieff, Captain Loman, Captain Rodionoff, and Naval Constructor Koutaneyoff. This was in 1879. At this writing (1903) Captains Semetschkin and Loman have passed away; Captain Avalan is now Vice-Admiral and Imperial Minister of Marine; Captain Alexeieff, now Vice-Admiral, is also Viceroy of Manchuria; Captain Rodionoff is an Admiral; and Naval Constructor Koutaneykoff is Constructor-in-Chief of the Russian navy.

Upon examination of Cramps' shipyard, they decided that Mr. Barker's selection was well judged, and approved his recommendations that the work projected be done there.

The war between Russia and Turkey was still in progress, and there was every indication at that moment of British intervention. The purpose of the Russians was to fit out a small fleet of auxiliary cruisers or commerce destroyers to cruise in the North Atlantic in the route of the great British traffic between the United States and England. Their idea was that the fitting out of such a fleet with its threatening attitude toward their North Atlantic commerce might or would deter the

British from armed intervention in behalf of the Turks.

At first the Russians made pretence of great secrecy as to their movements. "Pretence of secrecy" is the only phrase that can adequately express their attitude. On the other hand, the appearance of the "Cimbria" on the coast of Maine at Bar Harbor, filled with Russian naval officers and seamen, was not concealed, but on the other hand ostentatious. It of course instantly attracted the attention of the British Ministry and excited their apprehension as to the possible outcome; apprehension which the stories that for the time being filled the papers of New York and New England certainly did nothing to abate. An examination of the files of the *Evening Star* and the *North American* at this time would be interesting reading. The *Evening Star*, May 1, 1878, has an account headed, "*What brings the Russian Steamer to Maine?*" May 2: "*Suspicious Craft.*" May 6: "*Suspicious 'Cimbria' to leave her Station.*" Some accounts "*to stir up the Irish.*" May 8: "An Account of the ' egg-eating' incident."

The *North American*, May 13, states that the captain of the "Cimbria" "has said that Russia is preparing to attack Great Britain by sea;" and refers to the disastrous effects on

our commerce during the Civil War by the work of the Confederate cruisers which practically drove the American flag from the ocean.

Captain Gore-Jones, the Naval Attaché of the British Legation at Washington, and others visited Bar Harbor at the time the "Cimbria" was there. They made their visit incognito, as they imagined, and they located themselves daily on the landing pier near the Bar Harbor Club House, where all the Russian officers who were aboard the ship landed every day. It happened that one of the officers knew Gore-Jones notwithstanding his disguise. The British Attaché was sitting upon the pier with a slouch hat on his head and a fishing-rod in his hand, intently watching and patiently waiting for a bite, and apparently oblivious to all that was going on except at the other end of his line. When this officer passed him on the pier, he said in very good English, "Captain Gore-Jones, the fish do not seem to be anxious to make acquaintance with you!"

The visit of these officers to the shipyard of course was carried out with a great deal of real secrecy, and arrangements were made to buy three or four fine and up-to-date merchant ships and to transform them into cruisers, and also to build a small new cruiser.

Mr. Cramp first applied to the American

Line to buy three of their ships, but the president of the company was too much astonished to give him any satisfaction; or, at least, he was not prepared to act as promptly as the occasion required, and lost the chance of selling the ships, to the most profound disgust of Mr. Thomas A. Scott, of the Pennsylvania Railroad, which corporation had a paramount interest in the ships and wanted to sell them!

The "State of California" was on the stocks at Cramps about ready to launch. This board of officers inspected her. They also looked at the "Columbus," sailing between New York and Havana, a ship that Cramps had built for Mr. Clyde,—and the "Saratoga," a ship that had belonged to the Ward Line, built by Mr. Roach for that same trade, and were favorably impressed.

Up to this time the presence of these gentlemen in Philadelphia was not known or suspected; but when the purchases were made, Mr. Barker decided that, while the time had arrived when it was necessary to remove the veil of secrecy, the Cramps should continue to maintain it as to the actual work and its progress.

Mr. Cramp arranged with Mr. Alexander McCleary with this end in view. Mr. McCleary was at that time the principal reporter of the

Evening Star, and a friend and member of the Harrison Literary Association, to which Mr. Cramp belonged. The whole affair was managed by him most admirably. On May 16 the *North American* and *Evening Star* made the first announcement that indicated what the Russians really intended to do. These papers gave an account of the sale of the "State of California," and that $100,000 was paid on account to A. A. Low & Co., the agents of the Pacific Coast Navigation Company. May 16 was the day of the launch, and on the next day preparations were made to remove the joiner and cabin work, a full account of which appeared in the daily papers.

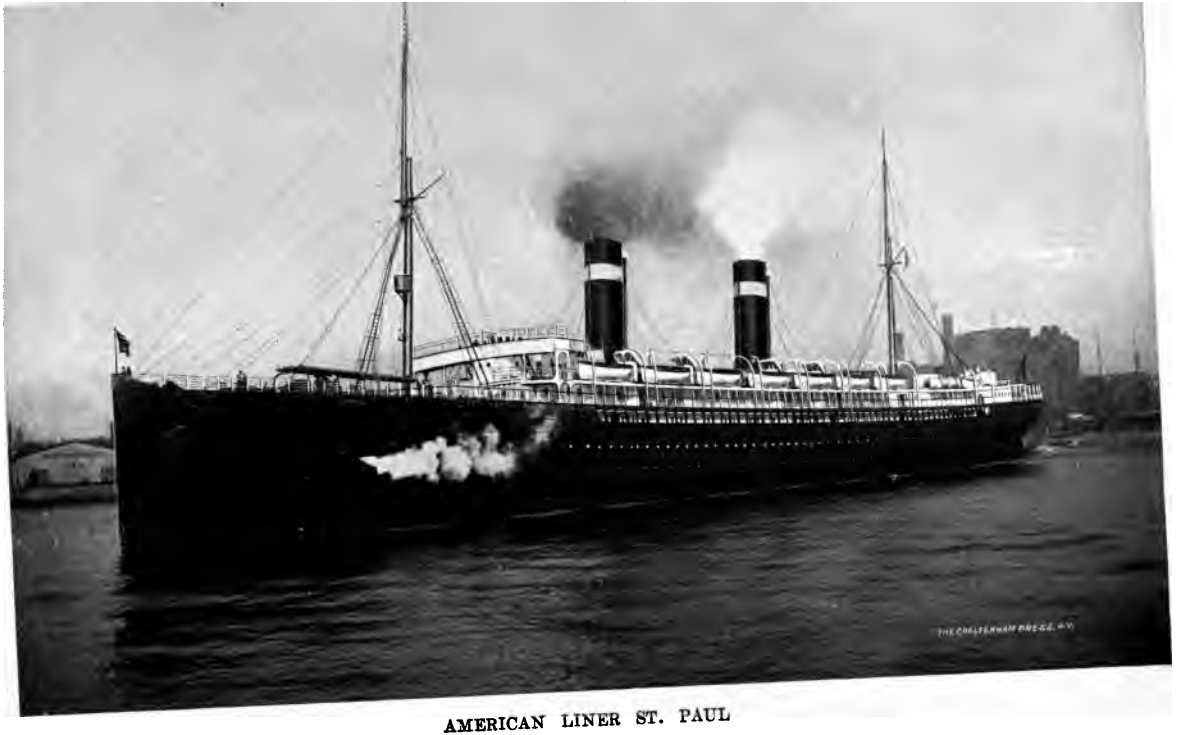
Mr. Cramp ultimately purchased in addition the steamships "Columbus" and "Saratoga." These two and the "State of California," after being converted into auxiliary cruisers, were named the "Europe," "Asia," and "Africa." Then the Russians contracted for a small cruiser which they called the "Zabiaca" (Mischief-maker). This ship was a regularly designed man-of-war of a special type, and at the time of her completion was the fastest cruiser in the world. The four ships were fitted out under the direction of their captains respectively. The commander of the "Europe" was Captain Grippenburg; of the

"Asia," Captain Avalan; of the "Africa," Captain Alexeieff; and the commander of the new cruiser "Zabiaca" was Captain Loman.

The three ships purchased and converted into commerce destroyers were, so far as internal arrangement and outfit were concerned, altered altogether as to the respective ideas of their commanders, and they all differed very much. They embodied very complete and somewhat ornamental accommodations, and every modern convenience as understood at that time was included in their design.

During these operations the show of secrecy was maintained, but Captain Gore-Jones still zealously endeavored to keep himself and his government *au courant* with everything that was going on. In pursuit of this duty, he managed on one occasion to get into the shipyard in the disguise of a workman and on the pass or ticket which was then issued for the admission of workingmen. He was, however, soon observed by Captain Avalan of the " Asia," who at once reported the fact of his presence to the office. Captain Gore-Jones was then politely but firmly ushered out of the shipyard and requested not to enter it again.

This incident of Captain Gore-Jones's futile attempt to play detective attracted wide attention and much comment. Among the news-



AMERICAN LINER ST. PAUL

paper articles on that subject was one in the columns of the Washington *Sunday Capital*, a journal then having national reputation for wit and humor. The material part of it was as follows:

"Among the ornaments of the Diplomatic Corps is a possible, though not altogether probable, successor of Nelson. He appears in the Congressional Directory as Captain Gore-Jones, Naval Attaché of H. B. M. Legation. Neither one of his two names, viewed separately, suggest aristocracy. Both viewed together in normal condition are not calculated to excite suspicion of blue blood. Still, Gore-Jones is an aristocrat. The hyphen is what does it. For the rest, Gore-Jones, being an English naval officer, is a Welshman born in Ireland.

"His duties are supposed to be the observing of things naval in this country. Being unable to discover a navy, or anything resembling one, in possession of the United States, it occurred to him that perhaps he might find here a navy or part of one belonging to some other power. In fact, it was rumored in the Corps Diplomatique that Gore-Jones had been notified that he must either find a navy in this country somewhere and belonging to somebody or lose his job. Naturally, his first quest would be at our navy-yards (so-called), but at none of these could he even detect symptoms of naval intention. All he could find was a few old hawse-holes. He was informed that these had been accumulated by that jolly old tar, the rotund Robeson, with the intention of building wooden tubs around them whenever Grant might happen to run for a third term. He was also informed that the present reform administration of the venerable Richard

W. Thompson, of Indiana, viewed these hawse-holes with suspicion. This was because they were hollow; whereas the venerable reformer believed that everything about a ship should be solid.

"Despairing of the navy-yards, Gore-Jones turned his attention to places where merchant-ships were constructed. He heard that the Cramps, of Philadelphia, were building something that did not look merchant-like. He resolved to see it. Incidentally, he had heard rumors that the queer craft at Cramps' was being paid for along by instalments of Russian money.

"Trouble was brewing between Russia and England. Aha! At last! Gore-Jones had struck it rich. Let him unearth this foul conspiracy to imitate in 1879 the pious example England had set with the 'Alabama' in 1863, and he would surely get a star. He might even get a garter.

"But how? Cramp had views of his own as to private property. He was not under diplomatic jurisdiction, as were the navy-yards. In fact, the sign was out at Cramps', 'No English need apply!' This, however, was rather incentive than obstacle to Gore-Jones. He needn't be English. Nature had endowed him with an assortment of mental and bodily peculiarities, mostly bodily, that adapted him to almost any nationality. He resolved to be an Irishman. He at once began an arduous practice of the brogue. First he had to get rid of the cockney drawl which is enjoined by regulation in the English navy. Demosthenes is said to have overcome a tendency to stutter by orating with his mouth full of pebbles. Gore-Jones got rid of the regulation cockney drawl of the English navy by talking with his mouth full of Irish whiskey.

"Finally, he considered all preliminary difficulties overcome, and began a siege of Cramps' shipyard by regular approaches. Finding it impregnable to front attack, he resolved to flank it. This he accomplished by taking possession of an adjoining lumber yard in the night-time. Early in the morning he entered the fortress by its sally-port. Success was in his grasp,—almost. It glittered, then it glimmered, then it fizzled out. There was one peculiarity he couldn't overcome. That was his remarkable resemblance in form and figure to 'Punch's' standard cartoon of 'John Bull.' He could smoke a short, black pipe with the bowl turned down equal to the most Corkonian Irishman in Fishtown. He could also fairly imitate that peculiar accent produced by filtering conversation through the teeth, commonly known as the brogue, particularly when the conversation was diluted with a mouthful of Irish whiskey. But he couldn't escape his shape. One of the Russian officers on duty at Cramps', with that keenness characteristic of Napoleon's 'scratched Tartar,' penetrated all his disguises. Then he was ignominiously ejected by one of those decrepit men who, when they get too old to build ships, are usually employed by Cramps' as watchmen. *Sic transit gloria mundi.* Exit Gore-Jones. But he will remain with us. He will hold his job. He deserves to. He has done what no American has ever been able to do since the collapse of the Rebellion. He has discovered a navy—an actual, real, live navy—in the United States. The fact that it is a Russian navy and not an American one, humiliating as it may be to us, is a huge feather in the cap to him. We hasten to doff our editorial chapeau to Gore-Jones. We are confident he will get his star. We fervently hope he may get also the garter."

At this point Mr. Cramp's own narrative of the subsequent proceedings will be more graphic and interesting than any other form of description could be:

"Great activity marked the progress of alterations and fitting out of the vessels. The yard was filled with men, some working night and day, and the vessels were all fitted out at a very early date, considering what had to be done. They were more than rebuilt. Each ship was fitted out for an admiral and the accommodations for officers and men were ample. They were full sparred and square-rigged.

"The indications that the English would join the Sultan at any time still prevailed at the time the vessels were ready to go to sea. When the 'Europe,' 'Asia,' and 'Africa' were ready to depart, they had to go without any guns, because all the loose guns that the Russians could spare from the navy were mounted on forts, and none could be appropriated for these ships, so they had to depart without guns. They expected when they came here to be able to purchase guns in this country from some of the gun manufacturers, and they were very much amazed to find that our government had not permitted any gun factories to exist here. So they had to go without.

"The captains all showed great determination and pluck, but their going away was not under the conditions usually attending the departure of war vessels. They expected when they left that England would openly espouse the cause of Turkey before they arrived at the other side, and they were all prepared to sink their ships rather than surrender. They felt that their case was particularly

hard and that their hands were tied, and having no guns they were at the mercy of the enemy. They could not find much satisfaction of sinking with their own ships unless they had done some damage to the enemy, so under the circumstances their sailing was a very sad occasion.

"The 'Zabiaca' being a new vessel, it took longer to finish her, and by the time she was finished the war with Turkey was over, and they managed to get guns to put aboard her.

"The fitting out of this small fleet of commerce destroyers had the effect that the Russians originally intended it to have. It deterred the English from going in with the Sultan. The merchant fleet of England is too great and too vulnerable to permit their country to go to war for a trifle. England would suffer more in a war than any other nation on account of the large number of merchant-men under her flag; and it was because of the great number of her ships and the danger and loss from their destruction that made the British government and its people labor so hard to have our navigation laws repealed, so that a fictitious sale could be made and the vessels of their merchant marine could be put under the protection of the American flag. As two of our statesmen said (Henry C. Carey and Judge Kelley), 'As long as our navigation laws remain as they are, England will be under perpetual bonds of indemnity to keep the peace with all the small nations in the world, because their merchant-ships cannot fly to the protection of the American flag.' In this case the English saw the scheme of the 'Alabama' applied to themselves.

"These vessels went abroad, and most of them became flag-ships on foreign stations.

"The 'Europe' and 'Africa' became flag-ships, and the 'Asia' was afterward taken by the Grand Duke Alexis,

who made a yacht of her, and a very handsome one she made. She remains the Grand Duke's yacht to this day.

"The rest of the history of this transaction is generally known. The vessels were fitted out, went to sea, and made their way to Russian ports without interruption, and a final treaty of peace was effected through the Congress of European Powers at Berlin. I believe that the strongest argument the Russian government could offer to persuade Great Britain against intervention was the fitting out of these vessels as commerce destroyers in our shipyard.

"The next year during a trip abroad I visited Paris. I found there Captain Semetschkin, who told me that the Grand Duke Constantine was in the city and would like to receive me. The captain arranged that I should call the next morning, and at the same time informed me that the Grand Duke had given a contract for a new ship, afterward called the 'Livadia,' designed by Admiral Popoff and Dr. Zimmerman, to be built at the Fairfield Works at Glasgow. Admiral Popoff was a notable example of that type of man to which, for example, De Lesseps, and Keely of motor fame, and Eads belong. Such men affect an almost celestial knowledge in everything they undertake, and that affectation, coupled with an apparent sincerity of manner, earnestness of purpose, and unflinching nerve, often enables them to captivate people of good information on general topics, but unacquained with the technique of engineering problems; and who therefore are unable to detect the cunning charlatanry of such pretenders.

"Admiral Popoff had fascinated the Grand Duke Constantine with his peculiar type of war-ship, which was a circular floating turret of large dimensions that could be revolved by means of her propellers, so that, porcu

pine-like, she could present her 'bristles' in every direction to an enemy.

"Quite a number of the Popoff type of floating batteries were built, and a dry-dock was constructed for their special accommodation when repairs might be necessary. The 'Livadia' was the last production of Admiral Popoff, who, as I have already remarked, designed her with the assistance of Dr. Zimmerman, of Holland. She was not circular like her predecessors, but was oval in shape, the transverse diameter being almost but not quite equal to the conjugate, and she was fitted with three screws entirely under the bottom. Captain Semetschkin informed me that the Grand Duke was much impressed with this new design, and that nothing could shake his belief in its success. Being thus forewarned, I could avoid giving him an adverse criticism in case he brought the subject up by simply exercising a little diplomacy, as it was not my desire or intention to cross his predilections in any way. When I called on the Grand Duke at the Russian Legation, I found him reclining on a sofa, having severely injured his leg in a fall. He arose as I entered and invited me to take a seat in front of him. Being full of the subject, he immediately asked me if I would visit Glasgow soon, and when I stated that I intended to go there at an early date he gave me a letter to Captain Goulaieff, Russian Naval Constructor, who he said had charge of the construction of the new 'Livadia,' and that he had had prepared a working model fifteen feet long with engines complete as an experiment, and he wanted me to see it.

"I am sure he fully believed in the successful future of this type. He stated that he was confident that it would revolutionize merchant-ship as well as war-ship

construction, and his enthusiasm was unbounded in the contemplation of it.

"When he had exhausted the subject, which took some time, in elegant English and with fascinating fluency of speech, he changed the subject, and I was subjected to one of the most severe examinations in naval construction, equipment, and technical practice that I ever encountered. Of course, there was a change from my attitude of listener to that of a sort of principal in the conversation that followed.

"In referring in a complimentary way to the new fleet that we had turned out,—the outcome of the 'Cimbria' expedition,—the Grand Duke stated that one quality in them that impressed him more than any other was the large coal carrying capabilities of the vessels, and he asked me how I explained it. I stated that the models of the ships were of the best American type with certain improvements of our own.

"Expressing himself in a complimentary manner as to what we had done and as to what I said, he then put the question to me with much 'empressement' and sympathetic interest of manner: 'Mr. Cramp, from what school of naval architecture did you graduate?'

"Fully appreciating all that was involved in the question from his stand-point and what he considered of paramount importance,—the necessity of the Technical School for Naval Officials—I was prepared for the question, and determined that my answer should be apropos; and that I would not permit myself and my profession to be disparaged, knowing that in Russia and on the Continent generally there were no great private shipyards, and that if a naval architect or ship-builder there did not graduate from a technical school, he was practically nowhere at that time. Trained as I was in Philadelphia in a first-

class shipyard, surrounded by others of the same kind and in close contact with New York, which city occupied the head and front of the ship-building profession in the world, I felt myself doubly armed and more than confident when my answer came promptly after the question.

"I said: 'Your Imperial Highness! when I graduated from my father's shipyard as a naval architect and shipbuilder, there were no schools of naval architecture. I belong to that race which created them!'

"This unexpected answer, and the gravity of my manner, astonished for an instant the Grand Duke, who glanced at Captain Semetschkin, and rising to his feet he bowed profoundly to me and sat down.

"The history of the 'Livadia' is well known,—encountering a storm in the Bay of Biscay she was somewhat battered up under the bottom forward. On account of her peculiar shape and light draught she did not respond quickly to the motions of a head sea; when her bow was lifted clear of the water, the following seas would strike the bottom very severely before she would come down.

"After serving at Sebastopol somewhat under a cloud, she was laid up; the propeller engines were ultimately put in three new gun-boats."

The departure of the "Cimbria" from Russia was a great event there, and all the officers who left Russia on that expedition have continued ever since to meet yearly on March 28 (O. S.), that being the date of their departure from Russia. On March 29, 1898, twenty years afterward, Mr. Cramp happened to be in Russia arranging for the contract between his Company and the Russian government for the

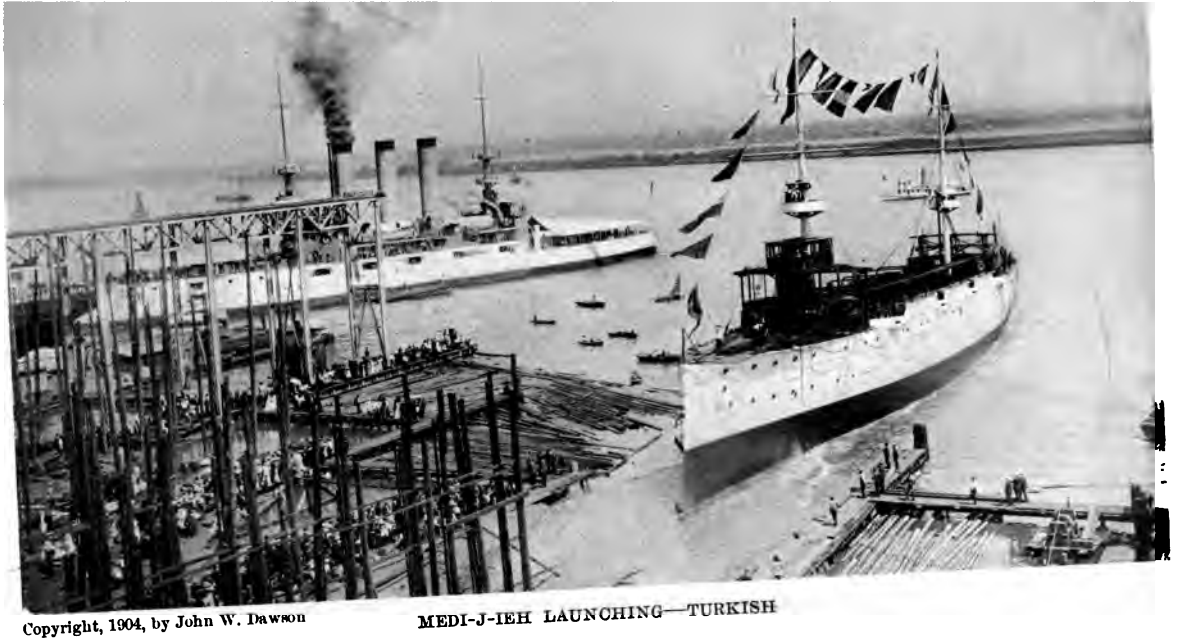
construction of the battleship "Retvizan" and the cruiser "Variag." A committee of officers at the time called and invited him to be present at their annual banquet as a guest. This committee was composed of some of the younger officers who were on the "Cimbria" expedition. They stated that no guest had ever been invited to one of these banquets, but they considered Mr. Cramp's connection with the fitting out of that fleet entitled him to the distinction of being the only guest they ever had on one of those occasions. He found there Vice-Admiral Avalan, the Assistant of the Minister of Marine and now Minister of Marine,—he had been captain of the "Asia;" Admiral Grippenburg, who had been captain of the "Europe;" and also about thirty of the sixty officers who left on the "Cimbria" on its first voyage. Of those absent, a great many had died, and some, of course, were away. Admiral Alexeieff was in China.

Mr. Cramp had begun his overtures with a view to naval construction for Russia as early as the fall of 1893. During that period the Russian Atlantic fleet was present in our waters to take part in celebrating the four hundredth anniversary of Columbus' discovery. The Grand Duke Alexander was an officer in that squadron, which during its stay

in our waters was at anchor for some time in the Delaware, and its officers freely visited the shipyard, carefully inspecting and examining all the work then going on. The general result was that they became enthusiastic with regard to the development of the art in this country and with the character of work being done toward the rebuilding of our navy, and they were also profoundly impressed with the facilities of Cramps' shipyard which might be utilized for increase of the Russian navy. They frankly said, however, that just at that moment it did not seem to be the policy of their government to have important work done for the Russian navy in foreign shipyards. This was, of course, true, for at that time Russia was not building any kind of naval construction more important than torpedo boat destroyers outside of her own domain. During the following years (1894, 1895, 1896) certain correspondence passed between Mr. Cramp and high officials in the Russian Ministry of Marine; though little progress was made during those years except to call the attention of the Russians in a vivid and forceful manner to the capacities and facilities which he controlled, and to strengthen the *entente cordiale* which had so long existed between the Russian naval authorities and himself.

At this point it becomes necessary to take up a new branch of the general subject, which is that of foreign work.

While the correspondence with the authorities of the Russian government above referred to was going on, our Minister at Tokio, Mr. Dunn, called the attention of the Japanese government to the fact that their expenditure of vast sums of money on a new navy in England principally, and also in France and Germany on a smaller scale, was well known; and in a diplomatic way he suggested that some of that kind of patronage bestowed upon the shipbuilding interests in the United States would be extremely gratifying to the American people. He also thought that the popularity of such a project in this country would be made universal if part of the proposed patronage should be awarded to the Atlantic and part to the Pacific coast. Minister Dunn's suggestion was taken up by the American Trading Company in the Orient, and their joint advocacy of the scheme was crowned with success. Acting upon intimation of such a suggestion, the Cramp Company and the Union Iron Works of San Francisco sent agents to Japan, and when they returned, contracts were made with the Japanese Minister Toru Hoshi, representing the Imperial Government, and the two



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MEDI-J-IEH LAUNCHING—TURKISH

ship-building companies above mentioned. The ship built by Cramp is now known in the Japanese navy list as the "Kasagi," and that built by the Union Iron Works of San Francisco as the "Chitose."

Up to that time the Japanese navy had been built almost exclusively in England, and with unimportant exceptions wholly by Armstrong. Of the vessels which won the naval battles on the Yellow Sea in the Chino-Japanese War of 1894 almost all, with the exception of a few torpedo craft, were built by Armstrong & Company at Elswick.

There was, however, one difficulty in the way of Japanese patronage of American shipyards in the construction of naval vessels. This difficulty soon came to the surface, but was averted by the urgency of diplomatic considerations. It grew out of the fact that the money which Japan was using to augment her navy was that which she realized from the Chinese Indemnity paid under the provisions of the Treaty of Shimonoseki. This indemnity had been furnished by Russia and financed in England or by English capitalists; and it appeared that there was a sort of tacit, if not express, understanding that most of it was to be spent in naval construction, and that the ships which it was to pay for should be built in English

shipyards. However, the Japanese naval authorities were extremely desirous of adding one or more America-built ships to their fleet; their idea, from the professional point of view, being that, as they were then about prepared, or had been for some time engaged in preparing, to build ships at home in their own dock-yards, the possession of one or more American-built ships would be of value as samples, models, or object lessons. Finally, after considerable negotiation carried on partly with or through the Japanese Minister at Washington, and partly at head-quarters in Tokio, the Japanese government awarded a contract to Cramp for the construction of a first-class protected cruiser of the highest attainable speed. This contract was signed by Mr. Cramp on behalf of the Company and by Toru Hoshi, the Minister, on behalf of his Majesty, the Emperor of Japan. The vessel, the "Kasagi," was originally designed to be of about 5000 tons displacement, but was modified to a displacement of about 5500 tons. The guaranty was 17,000 indicated horse-power and twenty-two and one-half ($22\frac{1}{2}$) knots speed, to be determined by four runs, two each way over a measured course ten knots long. Upon her completion the ship was taken in charge by the

Japanese captain and crew, and upon her arrival home immediately took a conspicuous place in the Japanese navy. Although this vessel gave the most profound satisfaction in every respect, and although she had been built in the United States at a cost that compared quite favorably with relative contract prices elsewhere, the Japanese did not repeat the experiment for reasons already intimated. In fact, all the influence of British diplomacy upon the policy of Japan was successfully employed in securing the maintenance of the British alliance in opposition to the advance of the Russians in the direction of the Pacific and to retain the monoply that English shipbuilders, principally Armstrong, had previously enjoyed, and to prevent or prohibit the construction of any more vessels of war in the United States or in American shipyards.

Mr. Cramp continued his active correspondence with the Russian authorities with constantly increasing prospects of success. So promising had the situation become in the summer of 1897, that Mr. Cramp, who had gone to Europe to attend the Jubilee Session of the British Institution of Naval Architects and Marine Engineers, concluded to make a flying visit to St. Petersburg before the meeting. His stay there was not long, only about a week.

His object was to survey the ground and to ascertain definitely what prospect there was for the then rumored intention of the Russian government to put forth a large and formidable naval programme during the ensuing winter.

Mr. Cramp returned to England from St. Petersburg, and took part in the many meetings of the Jubilee Session referred to. One of the events of that occasion was a visit to the great Elswick Shipyards and Ordnance Works of Armstrong & Company, which Mr. Cramp himself describes in a private letter as follows:

VISIT TO THE ARMSTRONG WORKS.

"The officers of the Society of Naval Architects and Marine Engineers of the United States with certain officers of the American navy were invited to meet the representative Naval Architects and Marine Engineers of foreign nations and participate in the meetings of the International Congress of these bodies in London during the month of July, 1897.

"After various entertainments under the auspices of the Institute and a visit to and reception by the Queen at Windsor Castle, the party went to Scotland; after visiting Glasgow and stopping at Edinborough, where Sir Andrew Noble and Philip Watt, of the Armstrong Works, met them; they were to be escorted to the Works in the afternoon. Feeling sure that a visit of that kind to such a shipyard with a great crowd and in such limited time would be very unsatisfactory, and its results necessarily

incomplete, I concluded to go on to Newcastle the night before and make an exhaustive visit to the works there before the arrival of the large crowd. This being the greatest shipyard in the world, I desired to examine its new constructions in progress, with regard to their novelties in device and design, in my own way and my own time, without being carried along by a great crowd as in a 'personally conducted' tour. I therefore went on to Newcastle the night previous to the projected visit. When I arrived at the hotel in Newcastle, I found a Russian Naval Architect, Mr. Tchernigovsky, in the act of registering, and had gone there for the same reasons that I had, and we concluded to go to the works together. When we arrived at the Armstrong Works and had registered our names and had asked to be conducted through the works, we found that all the principals had gone to Edinborough, to return with visitors, and, after some hesitation on the part of the official in charge, we were escorted through the works by one of the clerks.

"We found that there were eighteen war vessels on the stocks! a list of which was found in the programme of the visit given us in the afternoon. The destination of the majority of the ships was known, but not indicated in the programme. Before we left Newcastle, I was enabled to locate all of the ships.

"We had not gone far in the shipyard before I saw a 7-inch armor plate suspended on slings ready for hoisting in its place on what appeared at first to be a high-speed, large protected cruiser, but on ascending the brow stage we found it to be an armored cruiser of advanced type and speed and with very heavy armor for that type of vessel.

"When we asked the young man as to the nationality of the ship he could not tell, but stated that was one of

the ships building on account of the firm. This was as interesting to Mr. Tchernigovsky as it was to me, and our examination was rather prolonged, no objection being made by the young man who escorted us, who not being a mechanic was indifferent as to our actions. We found before we left the works that they were two or three battleships of advanced type and superior model and three or four armored cruisers, whose destination was unknown to the people at the works outside of the office. There was one thing that we were sure of, that these ships were not building by the company for sale, and that there was an important mystery to be solved.

"By the time we returned to the office, we found that the Edinborough crowd had arrived, ready for luncheon, after which the whole party went through the works; there was but little time to see what was going on, and the character and the existence of these important ships entirely escaped the notice of the visitors. There were a number of Japanese and Chinese officers present with the visitors.

"We had for some time before this visit secured possession in China of copies of certain plans and specifications for an advanced type of armored cruiser, and after an examination we found that they were proposals of the Thames Iron Works for raising a loan and for building a fleet for the Chinese navy.

"The resemblance between the armored cruisers building and the Chinese plans was so great, that I am sure the Japanese ships were made from copies of the Thames Iron Works drawings. The whole scheme of the Thames Iron Works was excellent and feasible, and the Chinese lost a fine navy by not accepting the offer.

"I thought that the construction of such an advanced type of war vessel under the conditions was of sufficient

importance to inform Lieutenant Colwell, our Naval Attaché at the United States Embassy. When I called on him, he seemed surprised to find that I had made the 'discovery;' and he stated that he had wired a cipher despatch to Washington describing the ships, and that they were for the Japanese, and that he had been informed of it by the Chinese Naval Attaché, who was a very bright man and whose knowledge of the fact was from an absolutely correct source. Mr. Colwell stated that no one but the Chinese Attaché and himself was aware of it outside of the Armstrong's and the British government. Of course, the last persons to be suspected of knowing anything about the matter were the Japanese. Mr. Colwell was well posted as to the object of the great enterprise.

"It was easy for Armstrong's to keep a matter of this kind quiet, as they had built so many war vessels for various countries, and with eighteen on the stocks they would not be noticed; and, besides, they were never without one or two vessels under construction for sale.

"The character of the vessels and the information that I gathered from Mr. Colwell and the Chinese Attaché, and the fact that London was filled with foreign naval officers, diplomats, and others in attendance on the festivities, gave me opportunities to secure much important information as to what was going on behind the scenes. The Japanese in numbers and importance exceeded the delegates of the other nationalities that participated in the Naval Architects' ceremonies, and they were treated in the most obsequious and deferential manner by all of the British dignitaries, ship-builders, ordnance and armor makers, dealers in supplies, and the English people generally.

"Soon after the Armstrong visit I met a Japanese nobleman, Marquis Ito, or Iendo, at the Lord Mayor's

reception. He was the head and front of the Japanese contingent, judging from the amount of adulation that prominent British dignitaries and ship-builders accorded him. Desiring to be sure of the facts in relation to the Japanese ships at the Armstrong Works I accosted him with an air of knowing all about it and as if there was no use of his denying it,—hurrying along with my description in elaborate detail, giving him no opportunity to reply,—I said: 'Oh, Marquis Ito! I have just examined your very fine ships at the Armstrong Works. They are superior to anything in any navy, British or any other, and with the speed of twenty knots and 7-inch armor and excellent model, etc.;' running along without giving him time to reply until I got out of breath and stopped.

"During my talk his face was a study. It was impossible to note or guess at his impressions, and I was extremely doubtful as to the result; but the fact that we were then building a Japanese war vessel, the 'Kasagi,' led him to believe that I knew something, particularly as my elaborate description in detail of the qualities of the ships under construction was correct; so, being sure that I was thoroughly posted, he made no denial, but bowed smilingly and with an air of approval. I had no opportunity of discussing the new fleet with Mr. Tchernigovsky after we left the Armstrong Works, but from information I subsequently received I was satisfied that his early visit to Newcastle was not accidental.

"The discovery of the construction of this fleet was the origin of my article on 'The Coming Sea Power' in the *North American Review* of October, 1897.

"I ascertained while in London, from additional sources not to be mentioned here, that the construction of these ships was undertaken in consequence of a secret alliance

between Great Britain and Japan to prevent the United States from securing possession of the Sandwich Islands and to head off the Russians in the Pacific, etc.

"The great engineering strike in Great Britain during this time delayed the delivery of the Japanese vessels and the construction of the great fleet of British ships then under way for two or three years, and the whole thing fell through because the favorable opportunity had passed. The delay gave them time to think it over. And, besides, we were beginning to make a show of naval power. It was also at this time that the Germans were beginning to show their practical aspirations in the direction of 'sea power.'

"The construction of the ships and their object was known also to Captain Gregorovitch, Russian Naval Attaché in London, and that probably accounted for the visit of Mr. Tchernigovsky.

"One interesting circumstance in connection with this strike and its consequences was the fact that under the operations of the strike a very large number of the best English shipyard workmen and engineers went to Germany, and became permanently located there in the shipyards; and while their absence crippled Great Britain, they more than any other cause advanced the construction of the German navy; so that while the leaders of the strike in England gained nothing by it there for the engineers but disaster to themselves and their country, they were conspicuously instrumental in assisting the most powerful rival of England

"It would be an interesting subject for reflection or discussion as to what might have been the consequences if the strike had not occurred and the Japanese and British fleets had been finished two years before they were.

"At the time these fleets were started there existed

throughout the naval world a lull in war-vessel output, particularly so in Russia and the United States, until some time after the announcement of the Japanese policy. The Germans had, however, been much in advance in the way of waking up and realizing the real situation."

The programme of the visit to the Armstrong Works embraced the following list of war vessels then building there. This programme did not indicate the destination of any of these ships, so far as they were being built for foreign account, and that designation included all of them except one third-class cruiser of 2800 tons displacement building there for the English navy. Therefore the destinations of all war-ships then building at the Armstrong Works which are noted in the margin of the programme are those dropped from other sources of information, all of which turned out to be absolutely true. It should be explained here that the policy of the Armstrong Company in building vessels of war for foreign navies always was to keep their destination secret as long as possible. And here it may be added that Brassey's "Naval Annual," the most comprehensive work of its kind that ever existed, did not in its issue for the year 1897 contain the destination of any of these ships building at Armstrongs for foreign account, and that the same

work for the next year did give their destinations based upon the disclosures made by Mr. Cramp in connection with Commander Colwell, our Naval Attaché in London, and the Naval Attaché of the Chinese Legation there. With this explanation, we present a copy of the programme of the visit, with Mr. Cramp's annotations as noted above.

THROUGH NEW SMITH'S SHOP TO

ELSWICK SHIPYARD.

Sir W. G. Armstrong, Whitworth & Co., Limited, have now under construction the following vessels of war:

	Tons.	Speed in Knots.	For
One armored-clad battleship.....	14,800	18	(Japan.)
One armored-clad battleship.....	12,200	18	(Japan.)
Two first-class armored cruisers, each of.....	9,600	20	(Japan.)
One first-class armored cruiser....	8,500	20	Chili.
Two fast protected cruisers.....	4,500	24	China.
Two fast protected cruisers.....	4,300	22½	(Japan.) Portugal.
One fast protected cruiser.....	4,250	21	Chili.
Two armor-clads.....	3,800	17	Norway.
Three fast protected cruisers, each of.....	3,450	20	Brazil.
One third-class cruiser.....	2,800	18	England.
One training ship.....	2,500	14	
One torpedo-boat destroyer	300	30	
Two first-class armored cruisers, contracted for	9,750	20	(Japan.)

Besides mercantile vessels at their shipyard at Walker.

By the end of the year 1897, or rather during this year, besides the ships enumerated above

for Japan there were in course of construction elsewhere:

One battleship ("Fuji"), in commission.

One battleship, 14,800 tons, building at Thames Iron Works.

One battleship, 14,800 tons, building at Thompson's.

One battleship, 10,000 tons, under consideration, the Armstrong Works (contract not signed).

One armored cruiser, 9600 tons, ordered at Vulcan Works.

One armored cruiser, 9600 tons, ordered at St. Nazaire.

Four torpedo-boat destroyers of 30 knots, similar to British destroyers of 30 knots, building at Yarrow.

Four torpedo-boat destroyers of 30 knots, similar to British destroyers of 30 knots, building at Thornycroft.

One torpedo-boat destroyer of 30 knots (?), similar to British destroyers of 30 knots, building at Schichau.

Eight torpedo boats of 90 tons, Schichau.

Four torpedo boats of 90 tons, Normand.

The Japanese battleships are named "Yashima," "Hatzure," "Mikasa," "Asahi," and "Shikisima."

The first-class armored cruisers with seven-

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MEDI-J-IEH IN COMMISSION

inch side armor at Armstrong's were the "Asama," "Idzumo," "Iwate," and "Takima;" at St. Nazaire, France, "Azuma;" and at the Vulcan Iron Works, Stettin, Germany, the "Yakumo." Five battleships, 6 armored cruisers, and 21 torpedo boats under construction in 1897, in addition to the ships in their own yards.

Soon after his return to America, Mr. Cramp decided that the results of his visits to the Armstrong Works should be given to the public, as there were no obligations of secrecy imposed on him, and particularly as he thought that the United States was, or should be, interested in the matter; besides, he desired to extend the field of the operations of their ship-building works abroad and secure a small portion of the construction of warships which England, France, and Germany had monopolized, and for that purpose he prepared a paper, which was printed in the November number of the *North American Review* for 1897. This paper added a considerable scope of discussion applying directly to the relative naval activity of Russia and Japan, and drawing, or rather pointedly leaving for inference, the conclusion that Russia was not keeping pace with the de-

velopment of her already great and rapidly growing rival in the Oriental Pacific.

This paper was as follows:

"THE COMING SEA POWER."

"Most well-informed people have a pretty clear general idea that the present is an era of unexampled naval activity throughout the civilized world; that great fleets are building everywhere; that the ships composing them are of new types, representing the highest development of naval architecture and the most exquisite refinement of the art of naval armament. Doubtless, a much smaller number of persons are aware that a new factor of imposing proportions has come into the general situation; that the newest member of the family of civilization is with rapid strides reaching a status of actual and potential sea power with which the older nations must henceforth reckon most seriously.

"It is, however, questionable whether any one not intimately conversant with the current history of modern ship-building, or not qualified to estimate properly the relative values of actual armaments, can adequately conceive the vast significance of the prodigious efforts which this youngest of civilized nations was then, and still is, successfully putting forth toward the quick and sure attainment of commanding power on the sea.

"In order to estimate accurately the significance of the current naval activity of Japan, it is requisite to trace briefly her prior development as a maritime power.

"The foundation of the Japanese navy was laid by the purchase of the Confederate ram 'Stonewall,' built in France in 1864, surrendered to the United States in 1865, and shortly afterward sold or given to Japan. This ship was soon followed by another of somewhat similar

type, built at the Thames Iron Works in 1864–65, now borne on the Japanese navy list as the 'Riojo,' and used as a gunnery and training ship.

"From that time to the period of the Chinese War the naval growth of Japan was steady, and, considering her very recent adoption of Western methods, rapid.

"At the beginning of that war, Japan, though possessing a very respectable force of cruisers and gunboats, mostly of modern types and advanced design, had no armored ships worthy of the name. The old 'Stonewall' had been broken up, the 'Fu-So,' the 'Riojo,' the 'Heiyei,' and the 'Kon-Go,' built from 1865 to 1877, were obsolete, and the 'Chiyoda,' the only one of modern design and armament, was a small armored cruiser of 2450 tons, with a 4½-inch belt, and no guns larger than 4.7-inch caliber.

"The unarmored fleet, however, on which she had to rely, was for its total displacement equal to any in the world. It embraced three of the 'Hoshidate' class, 4277 tons and 5400 horse-power; two of the 'Naniwa' class, 3650 tons and 7000 horse-power, which had been considered by our Navy Department worth copying in the 'Charleston;' the 'Yoshino,' 4150 tons and 15,000 horse-power, and about fifteen serviceable gun-vessels from 615 to 1700 tons. All of the cruisers had been built in Europe, but most of the gun-vessels were of Japanese build, and represented the first efforts of the Japanese people in modern naval construction.

"Among the results of the war was the addition of several Chinese vessels to the Japanese navy, including the battleship 'Chen Yuen,' of 7400 tons and 6200 horse-power, and the 'Ping Yuen,' armored coast defence ship, which had been captured by the unarmored cruisers of the Mikado.

"At the end of the war Japan had forty-three sea-

going vessels, displacing in the aggregate 79,000 tons, of which seven serviceable ships, with total displacement of 15,000 tons, were prizes.

"The navy of Japan in commission at that time (1897) embraced forty-eight sea-going ships, of 111,000 tons displacement, and twenty-six torpedo boats. The five sea-going vessels, of 32,000 tons total displacement, which had been added since the war, represented the most advanced types of modern naval architecture, and included two first-class battleships of 12,800 tons each, the 'Fuji' and 'Yashima.'

"The ship-building programme then in progress of actual construction was calculated to produce by the year 1903 a total effective force of sixty-seven sea-going ships, twelve torpedo-catchers, and seventy-five torpedo boats, with an aggregate displacement of more than 200,000 tons.

"To the navy in commission or available for instant service, already described, Japan now adds, in plain sight under actual construction in various stages of forwardness, a new fleet vastly superior to it in power and efficiency.

"Here I desire to say that the word 'progress,' in its conventional sense, does not adequately indicate the naval activity of Japan. The word implies continuity, by more or less even pace, in one of two directions, or in both; one direction is an increase in tonnage, with but little or no improvement in efficiency; and the other is a marked advance of new ships in all the elements of offence, defence, staying power, and economy.

"The first condition of progress is represented by the present activity of most nations who are sailing along evenly and with self-approval in fancied superiority. The second condition is represented by Japan, who suddenly

appears as a cyclone in a smooth sea of commonplace progress.

"Japan is not only building more ships than any other power except England, but she is building *better ships in English shipyards than England herself is constructing for her own navy.* While other nations proceed by steps, Japan proceeds by leaps and bounds. What other nations are doing may be described as progress, but what Japan is doing must be termed a phenomenon. She is building:

"(1) Three 14,800-ton battleships, which are well advanced at the Armstrong Works, Thompson's, and Thames Iron Works, respectively.

"(2) One battleship of about 10,000 tons, commencing at the Armstrong Works.

"(3) Four first-class armored cruisers of 9750 tons displacement and twenty knots speed at the Armstrong Works; one at the Vulcan Works, Stettin, Germany, and one in France.

"(4) Two 5000-ton protected cruisers of about twenty-three knots speed; one at San Francisco and one at Philadelphia.

"(5) One protected cruiser of 4300 tons and about twenty-three knots speed, at the Armstrong Works.

"(6) Four thirty-knot torpedo-boat destroyers at Yarrow's.

"(7) Four more of similar type at Thompson's.

"(8) Eight 90-ton torpedo boats at the Schichau Works, Elbing, Germany.

"(9) Four more of similar type at the Normand Works, France.

"(10) Three 3000-ton protected cruisers of twenty knots, three torpedo gunboats and a despatch vessel, at the Imperial Dock-yard, Yokosuka, Japan.

"(11) The programme for the current year embraces

a fifth armored cruiser of the type previously described (9600 tons and twenty knots), to be built also at Yokosuka.

"This is Japan's naval increase actually in sight. Excepting the ships building at Yokosuka, the whole programme has come under my personal observation.

"Comparison with the current progress of other powers discloses the fact that Japan is second only to England in naval activity, being ahead of France, much in advance of Germany, and vastly in the lead of Russia and the United States. It must also be borne in mind that the new Japanese fleet comprises throughout the very latest and highest types of naval architecture in every respect of force, economy, and efficiency.

"The spectacle of Japan surpassing France and closely following England herself in naval activity is startling. Considering the shortness of the time which has elapsed since Japan entered the family of nations or aspired to any rank whatever as a power, it is little short of miraculous. Yet it is a fact, and to my mind it is the most significant single fact of our time. Nations do not display such energy or undertake such expenditure without a purpose.

"It can hardly be maintained that Japan aims her vast preparations at the United States; at least, not primarily. The pending Hawaiian affair has given rise to some irritation, but its importance has been systematically exaggerated by the English press. It cannot, in any event, go beyond the stage of diplomatic exchanges. Japan will, doubtless, receive from the United States sufficient assurance that the rights of her subjects in Hawaii will be protected in case of annexation, and thus far she has asked no more than that. She is certainly entitled to no less.

"The object of the English in encouraging Japan to make a bold front against the United States was and is, like all their objects, purely commercial. They hoped to stir up in the Japanese mind an ill-feeling that would prevent the award of any more contracts to American shipyards, and even this characteristic stratagem is not likely to have more than a temporary effect. Thus I think it may be assumed that Japan's immense naval preparation is not made with the United States in hostile view; certainly not mainly.

"Assuming these conditions to be beyond dispute, and considering that the completion of the Trans-Siberian railway will at once make Russia a great Pacific power, politically and commercially, her naval situation in those seas must become a matter of prime importance; perhaps not of equal importance with that of the United States now, but at once sufficient to challenge the best efforts of her statesmen.

"Having all these facts in view, and being in a position to judge with some accuracy of the significance and value of preparations which came under my own observation during a recent tour of Europe in my professional capacity, I could not help remarking the vast difference between the naval activity of Japan and that of the other two first-rate pacific powers, Russia and the United States. The existing situation in Russia and the United States, relatively speaking, can hardly be called more than the merest perfunctory progress, whereas the activity of Japan is really marvellous. If she were simply meditating another attack on China alone or unsupported, no such fleet as Japan is now building would be needed; certainly not the enormous battleships and the great armored cruisers. It must therefore be assumed that Japan's purpose is the general one of predominant sea power in the Orient.

"Japan may, and probably does, meditate a renewal of her efforts to establish a footing on the Asiatic mainland. Possibly, she may have in view the ultimate acquisition of the Philippine Islands! (This was written the year before the Spanish War.) But, whatever may be her territorial ambitions for the future, it is as plain as an open book that she intends, before she moves again, to place herself in a position to disregard and defy any external interference. This may be the true meaning of Japan's extreme activity in naval preparation at this time.

"I may say without violation of confidence that a Japanese gentleman of distinction, a civilian, not long ago remarked in conversation on this subject that 'while Japan was forced by circumstances to yield much at Shimonoseki that she had fairly conquered, she still secured indemnity enough to build a navy that would enable her to do better next time!'

"In view of all these facts, the question at once arises: Are Russia and the United States prepared or are they preparing to meet such conditions, and to maintain their proper naval status as Pacific powers? My answer to that question, based on observations of Japan's naval strength already in sight and on what I know of her intended programme for further increase in the immediate future, as compared with the relative conditions of Russia and this country, would be in the negative.

"Just now Russia is trying the experiment of reliance on her own Imperial dock-yards, including two semi-private shipyards under government control; while the United States has halted completely. The Russian dock-yards are efficient, as far as they go, and turn out good work, judging from such specimens as I have seen. But their capacity is not adequate to the task that is presented by the situation which I have delineated. No other nation relies wholly on its own public dock-yards for new naval

constructions. England, with public dock-yards almost equal in capacity to those of the rest of the world combined, builds over 65 per cent. of her displacement and 97 per cent. of her horse-power by contract with private shipyards and machine-shops. France, with very great dock-yard facilities, builds a large proportion of her hulls and machinery by contract. The same is true of Germany, Italy, and the United States. But Russia has no great private ship-building facilities, and there are no visible signs of the immediate development of resources of that description.

"Japan, on the contrary, though she has some facilities of her own, is drawing upon the very best resources elsewhere to be found; she is drawing on the ship-building power at once of England, France, Germany, and the United States. Not only that, but more than that; the vessels Japan is building in the shipyards of England, France, and Germany are superior to any vessels those nations are building for themselves, class for class.

"Hence, viewing the situation from any point at will, the conclusion of any one qualified to judge must be that, in the race for naval supremacy in the Pacific, Japan is gaining, while Russia and the United States are losing ground.

"It requires little prescience to discern that the issue which is to settle that question of supremacy as between the powers may not be long deferred.

"Though Japan's naval activity is primarily significant of a purpose to secure general predominance in Oriental seas, and though, as I have suggested, there is no immediate reason for, or prospect of, trouble between Japan and the United States involving naval armaments; yet, in the broad general sense of dignity on the sea, our country can by no means safely ignore or be inattentive

to the progress of our Oriental neighbor toward the rank of a first-class sea power in the Pacific Ocean. The completion of her fleet now building will, inside of three years, give Japan that rank, and the future programme already laid out will accentuate it. The superior quality of Japan's new navy is even more significant than its enormous quantity. She has no useless ships, none obsolete; all are up to date.

"Meantime, the attitude of the United States seems quite as supine as that of Russia. It is not necessary to go into minute detail on this point. Suffice it to say that, taking Russia, Japan, and the United States as the three maritime powers most directly concerned in the Pacific Ocean, and whose interests are most immediately affected by its command, Japan at her present rate of naval progress, viewed with relation to the lack of progress of the other two, must in three years be able to dominate the Pacific against either, and in less than ten years, against both.

"I have heard the question raised as to the character and quality of the Japanese *personnel;* I have heard the suggestion that, magnificent as their material may be, their officers and men are not up to the European or American standard. It is not my intention to discuss this phase of the matter. But it is worth while to observe that, if the Japanese officers with whom we are in daily contact as inspectors of work we are doing for their government are average samples, they have no odds to ask of the officers of any other navy whatsoever as to professional ability, practical application, and capacity to profit by experience. And it should also be borne in mind that they have had more and later experience in actual warfare than the officers of any other navy, or of all other navies. While all other navies have been wrestling with

the theoretical problems of war colleges, or encountering the hypothetical conditions of squadron evolutions, fleet manœuvres, and sham battles, the Japanese have been sinking or taking the ships, bombarding the towns, and forcing the harbors of their enemy. I do not know how others may view this sort of disparity in experience, but in my opinion it is the most portentous fact in the whole situation, and because of it no navy that has not done any fighting at all has the slightest license to question in any respect the quality of the *personnel* of the Japanese navy that has done a good deal of extremely successful fighting.

"On the whole, the attitude of Japan among the powers is in the last degree admirable. Her aspirations are exaltedly patriotic, and her movements to realize them are planned with a consummate wisdom, and executed with a systematic skill, which nations far older in the arts of Western civilization would do well to emulate."

In this paper, it need hardly be said, Mr. Cramp hewed to the line. He did not flatter the Russians nor did he omit to advise them of the full extent and unquestionable consequences of their procrastination and supineness. When the paper was prepared and had been finally revised, Mr. Cramp still hesitated about publishing it in that form. "The Russians," he said, "are extremely sensitive; they know their weakness, or the best minds among them know it quite as well as I have pointed it out in this paper. Of course, I intend it as an appeal to their patriotism and to their sense of their country's needs; but I am afraid that

it will hurt the sensibilities of some of them." However, after further consideration, Mr. Cramp determined to print the paper as it stood, and it was done. Probably no article appearing in an American magazine in many years, if ever, received as widespread or as earnest attention in Europe as did Mr. Cramp's paper on "The Coming Sea Power." As soon as the *North American Review* arrived in Europe, the paper was translated and printed in Russian and German and a copious synopsis of it in French, in the naval periodicals of the respective countries. It was also extensively discussed and criticised in the English press, both in the service papers and in the regular daily journals. In St. Petersburg, besides being translated and printed in the principal Russian magazine and discussed in the newspapers, it was made the basis of an address by one of the most eminent Admirals in the Russian navy. Mr. Cramp's cautious apprehension, already referred to, that it might touch the susceptibilities of Russian officers proved groundless; and it has been openly admitted by high officials of the Russian Ministry of Marine that the arguments and considerations so vigorously advanced by Mr. Cramp had an effect of no little potency in turning the scale of Russian policy, which a

few months later found expression in the great naval programme of 1898.

Early in the following spring Mr. Cramp received advices from St. Petersburg that the Ministry of Marine would be glad to entertain plans and proposals from him for the construction of at least two first-class battleships, two first-class protected cruisers of the highest speed, and thirty torpedo boats, under the new programme which had then, February, 1898, been finally authorized by the Ministry and approved by the Emperor Nicholas II.

Upon receipt of this information or suggestion, Mr. Cramp lost no time in preparing for the voyage. Although the time of year, early in March, was the most inclement season for a visit to the great northern capital, he cheerfully accepted the situation. So far as the general scheme and outline plans were concerned, he had substantially worked them out in anticipation, and not much delay was caused on that account. Early in March, 1898, Mr. Cramp sailed on the American Line steamship "St. Paul," bound for St. Petersburg by the way of Southampton. Upon his arrival at the Russian capital, he was immediately turned over to the tender mercies of what is known as the Technical Board. This in Russian naval administration is a Board composed of officers

representing all the branches of the service,—Line, Construction, Engineering and Ordnance, or the Artillery Branch, as they call it. The membership of this Board is considerable in number. For several weeks they subjected Mr. Cramp to a species of inquisition which might well have appalled a man of less resources, less determination, or less confidence in his own ultimate mastery of the situation. It is not worth while, even did our limits of space admit, to go into detail of Mr. Cramp's discussion of his proposed designs and plans with the members of the Technical Board. Suffice to say, that after some weeks of consideration, taking the widest possible range, a general agreement was reached, leaving but few questions open for subsequent determination, none of which were of vital importance. The sequel of the whole transaction was that on the 23d of April, 1898, contracts were signed by Mr. Cramp on behalf of the Company, and by Vice-Admiral V. Verhovskoy, Chief of the Department of Construction and Supply, on behalf of the Emperor, for the construction of two vessels, one first-class battleship, now known as the "Retvizan," and one first-class protected cruiser of the highest practicable speed, known as the "Variag."

In his operations at St. Petersburg leading

up to these important contracts, which aggregated nearly seven millions of dollars, including extra work ordered during construction, Mr. Cramp encountered powerful and persistent opposition from three widely diverse sources. First, there was an element strongly intrenched in the Ministry of Marine, who opposed the award of contracts to foreign builders other than the French. This element of opposition was powerfully represented on the Technical Board, and its influences were shown particularly in the Ordnance installation and in the Engineering section, who wanted everything done in Russia. It proved factious and troublesome, though not otherwise formidable, because the decision to have some of the ships in the programme of 1898 built abroad had already been reached in higher quarters. In fact, though not definitely so announced by the Russian government, it was known by the middle of March, 1898, at least by those intending to bid, that the Ministry of Marine had decided to award contracts for the construction of two first-class battleships, one armored cruiser, and three first-class protected cruisers of the highest speed in foreign shipyards, and a large number of torpedo boats.

The French and German shipyards were

represented not only by their own agents and experts, but they were backed, and their claims to consideration urged, with all the power and influence their respective Embassies and banking houses could command at the Court of St. Petersburg.

However, this situation was not at all unforeseen or unexpected by Mr. Cramp. To encounter opposition from the agents of the foreign banking houses and diplomats was a normal condition of this kind of business. Fortunately for Mr. Cramp, or, rather, fortunately for American industrial interests at large, we also had an ambassador at St. Petersburg in 1898. He was not of the common run of American diplomatic representatives "near" foreign Courts. He was different. Almost from the foundation of our government, a rule—amounting to unwritten law—had prevailed which forbade American diplomatic representatives abroad to do or say anything in aid or furtherance of commercial or industrial enterprises of American citizens in the country to which they were accredited.

Object lessons were before them. During Polk's Administration, James Buchanan, then Secretary of State, had removed, or rather transferred to another post, a United States Minister to one of the South American Re-

publics on the Pacific slope. This Minister had committed the, in United States "diplomacy," unpardonable offence of indorsing the drafts of certain whale-ship captains upon their owners in New Bedford and Nantucket. The ships of these captains were in distress, having been dismasted in tempestuous passages around Cape Horn, and they had made their voyage to Valparaiso under jury-masts. Arrived there, they needed money to repair and refit their battered and storm-beaten ships. Our Minister to Chile used his good offices to help them get their drafts cashed so they could repair their vessels and pursue their voyages. This, from the view-point of primitive United States "diplomacy," was of course a crime, and the Minister was made to suffer for it! Ultimately this unwritten law or tacit doctrine found expression on the floor of the Senate, in a debate on the Consular and Diplomatic Appropriation, from the lips of Thomas F. Bayard:

"The purity and dignity of our foreign representation," he said, "must be preserved! The law now recognized, though unwritten, should be made statutory! If an American Minister abroad should use any of the influence or employ any of the prestige or credit which he may derive from his status as a representative of this country to aid or further or promote any scheme or project of

American citizens in that country, having private gain in view, he should be held answerable for official misdemeanor!"

Buchanan and Bayard have already found their proper levels in American history, and need not be discussed here, even if their memories were worth discussion. But the theory they applied to our diplomatic representation was for many years the rule. The result was that our "diplomatic service" (so-called) down to, we may say, the end of Cleveland's last Administration, had become little else than a hospital for political cripples, or a sanitarium for over-worked old lawyers and nervously prostrated college professors. It was the laughing-stock of foreigners and the object of cynical, albeit good-natured, contempt on the part of our own people. It had become a symposium of urbane uselessness and solemn stupidity.

All this was changed in our representation at St. Petersburg in 1898. Our Ambassador there was the Hon. Ethan Allen Hitchcock, of Missouri. He was neither a political cripple, nor an overworked old lawyer, nor a college president needing a gilt-edged vacation.

He was a great and successful manufacturer, a man of broad and keen business instincts, and he thought that any scheme calculated to

disburse about seven million dollars among the workingmen and steel mills of the United States was well worthy the earnest attention and the best officers of the most dignified Ambassador. Imbued with such ideas, Mr. Hitchcock helped Mr. Cramp all he could. He may not have been as noisy about it as the German Ambassador or as strenuously in evidence as the French Ambassador, but he was none the less active or effective in his efforts to subserve and promote the interests of his country and her citizens. The maw-worm doctrine of Buchanan and the raven-like croaking of Bayard were lost upon such a man. Taking the situation altogether, it is safe to say, so far as diplomatic representation was concerned, the commercial and industrial interests of the United States and of American citizens in the Russian Empire were quite as well guarded in 1898 as were those of France and Germany.

The third element of opposition which Mr. Cramp had to encounter and overcome was of a purely technical or mechanical character. His plans involved installation of water-tube boilers of the Niclausse type. But up to that moment, ever since the adoption of the water-tube system by the Russian navy, the Belleville type of boiler had held undisputed sway there. The enormous wealth of the Belleville

people, their straightway, open-handed mode of doing business with naval officials, not only in Russia but in England as well, and their aptness in placing valuable things where they would do the most good, were all notorious. They had for some time admitted that the Niclausse system was their most formidable rival, and naturally they were ready to exhaust their resources to prevent its introduction into the Russian navy, where their monopoly, up to that time, had been perfect and invulnerable. This discussion was, of course, carried on wholly between Mr. Cramp and the Russian technical authorities. It was a subject that could not be touched by diplomacy or by personal influence; a contest to be fought out wholly on the mechanical merits of the respective systems and decided entirely by skilled judgment. In this kind of contest Mr. Cramp was at home, and he won. His staple argument was that for any naval power to surrender itself to a single type of proprietary boiler, thereby creating a monopoly against itself, could not be else than unwise; that the era of water-tube boilers was still in the experimental stage, that perfection was yet to be developed, and was doubtless a long way off. Exhaustive trials already made had demonstrated a wide range of efficiency and con-

sequent merit in the Niclausse system, and while it was no part of his contention to decry or depreciate the rival type, comparative performances of official record beyond dispute argued that sound marine engineering policy would forbid the exclusion of the Niclausse system. By the weight of these arguments Mr. Cramp carried all his points. The ultimate result of a six weeks' campaign was the award of contracts for construction of six vessels in foreign shipyards: one first-class battleship and one armored cruiser to the Forges et Chantiers, of France; one first-class battleship and one large protected cruiser of the highest attainable speed to Mr. Cramp, and two protected cruisers of type similar to the last,named to Germany yards, the "Germania" of Kiel and the " Vulcan" of Stettin.

Upon these awards, Mr. Cramp came home and began construction at once. Indeed, while still in St. Petersburg, he had placed orders for important parts of the material required, and had contracted for the necessary armor. At the outset some delay occurred, due to the extreme deliberation observed by the Russian Inspectors in approving detail plans and specifications, and to some changes made in the character and quality of material for protective decks after the contract was signed.

But notwithstanding these delays, Mr. Cramp completed and delivered both his ships long in advance of either the French or German builders, and such time penalties as had accrued by reason of the initial delays already referred to were remitted by direction of the Emperor Nicholas II himself.

The trial conditions imposed upon these ships were the most drastic and crucial ever known; they being required to develop their maximum speed for twelve hours continuously, as against four-hour or measured mile trials in other navies.

Upon the completion and delivery of these ships, Mr. Cramp had achieved the distinction of having done the greatest volume and highest value of ship-building for foreign accounts ever performed in an American shipyard. On their arrival at St. Petersburg, both ships were personally inspected by the Emperor, who was so pleased with the "Variag" that he ordered her detailed as escort to the Imperial yacht in a trip to Cherbourg.

It is worthy of remark that in the fall of 1898 our Navy Department advertised for proposals to construct three battleships, now known as the "Maine" class. The plan put forth by the Department was a modified and slightly enlarged " Alabama," with a speed

requirement of seventeen knots as against sixteen in the original type. Mr. Cramp offered to build an eighteen-knot ship within the statutory limit prescribed for one of seventeen knots, and used his Russian battleship as a basis of design. His proposition was accepted, and the other bidders—Newport News and the Union Iron Works, to each of whom one ship was awarded—were required to adopt Mr. Cramp's conditions of dimension and performance. In this manner the American navy as well as the Russian profited by Mr. Cramp's interesting and remarkable "Campaign of 1898."

CONCLUSION

THE foregoing chapters have dealt wholly with Mr. Cramp in what may be termed his public capacity,—in his attitude of a public servant of most important rank and most unfailing usefulness. The fact that he has been such a public servant, without official position or emolument, stands doubly to his credit. Viewing him in that relation alone, it may be said that he has designed and built, or has been responsible for the designing and building, more than three hundred ships of all kinds, classes, and destinations during more than half a century. It requires more than a second thought to adequately measure the impress a man makes upon the fortunes and the destinies of his era when he creates over three hundred ships either for commerce or for war.

Dismissing for the moment all thought of the perishability of things made by human hands, the imagination does not need a free vein to fancy an imperishable monument in legend, in tradition, and in history. The ships themselves run their course, meet their fate, and pass away. But the descendants of the men who sailed in them to the uttermost parts of

BATTLESHIPS INDIANA AND MASSACHUSETTS

the earth, if merchant vessels, or the progeny of the men who fought in them to save the country or to set a weaker people free, if men-of-war, will forever cherish their memories. In such a way Charles H. Cramp has linked his name with the era of his lifetime; and nothing has been attempted in the foregoing Memoir but to make, in assembled form, permanent record of the most important relations he has sustained to the destiny-shapers of mankind, the most arduous of the tasks he has undertaken, the most signal of the triumphs he has achieved, and the most perplexing of the difficulties and obstacles he has encountered.

No attempt has been made to portray the gentler and more genial side of his nature; that could be found in a survey of his social personality for its own sake and dissociated from professional striving or public service. From this point of view purely, another volume equal in extent to the foregoing could be written. But here the opportunity is denied. The boundless hospitality, the unflagging generosity, the inevitable good cheer and helpfulness to all who had in any way earned his confidence or invoked his gratitude, must be passed over with simple mention.

Immersed though he always was in affairs of the most practical and matter-of-fact na-

ture, Mr. Cramp could always find time for the society of the clever Bohemians of literature, art, and the drama. No other association was so congenial to him. No other business man of his time numbered so many friends and close acquaintances in that fraternity as he. In him they always found quick appreciation of their abilities and, when occasion might require, ready and cordial responsiveness to their incidents of vicissitude. During the scores of years through which he figured in a capacity as public and in affairs as momentous as ever fell to the lot of the highest official, constantly engaged in operations closely affecting the vitality and integrity of the nation, incessantly subject to a scrutiny hardly less searching than "the fierce light which beats upon a throne," the files of American print for a lifetime may be searched in vain for an ill-natured personal criticism upon his acts or achievements or an aspersion upon his character. Even partisans of his rivals, no matter what might be the bitterness of contention or the rancor of faction, always halted at personal animadversion upon him. This was not because he himself was reticent in criticism or always cautious in comment. Having always ready and welcome access to the columns of the most noted periodicals and the greatest

newspapers, and being by no means stingy of rhetoric, his innumerable newspaper interviews and frequent magazine papers invariably " spoke his mind" with neither extenuation nor malice, and always hewed to the line.

On one occasion he submitted a professional paper in manuscript to a friend of literary pursuits whose judgment he held in high esteem. "In that paper," he said, "I have done my best to avoid all controversial tendency. Please look it over and give me your view as to whether or not I have succeeded."

It was a paper on the subject of water-tube boilers involving discussion of the various types, and referring to the policies of different naval administrations at home and abroad in dealing with them.

"Well," he inquired, when his friend returned the paper, " what do you think of it?"

"I understood you to say, Mr. Cramp, that you desire to avoid controversial matter in this paper?"

"Yes."

" And you would strike out anything that might partake of that nature?"

" Yes."

"Well, in that case, there would be little left but the title of the paper!"